From:	Villa Sierra MHP
To:	Planning Department
Cc:	Nicole Smith; Heather Ferris
Subject:	Slaughterhouse plans for APNs 008-371-38, 008-371-39, 008-371-10
Date:	Tuesday, September 21, 2021 10:30:28 AM
Attachments:	Slaughterhouse plans09162021.pdf

To whom it may concern,

My name is Charlotte Stewart. I'm the manager of an all ages mobile home community called Villa Sierra located at 4999 US HWY 50 E, Carson City, NV 89701; APN #008-371-07. We have 42 families that live directly on the other side of a fenced lot in between our community and the proposed slaughterhouse at APNs 008-371-38, 008-371-39, and 008-371-10. I'm attaching the letter received 09/16/21 so you can see how close we are to the proposed slaughterhouse. I'm very concerned about this location for a number of reasons.

First it will most likely drive down home values in our park. We have some new tenants that would have to look out directly on the slaughterhouse and they most likely will not be happy.

Second what about the noise? We have a quiet nice community and the residents will not be happy if all the sudden it's noisy.

My final concern is the pollution; I grew up in a town with a huge slaughterhouse. I realize this one is much smaller but we have kids of all ages and elderly how much pollution will this expose their lungs to? Most of our homes have swamp coolers so in the summer it's very hard to keep out smoke. Growing up where I did caused me to have health issues with my lungs that never went away do to the burning carcasses. If you will not be burning them how much pollution will this expose us to? I look forward to hearing from you on these matters.

Thank you,

Charlotte Stewart
Villa Sierra MHP
4999 US HWY 50 E #1
Carson City NV 89701
(775) 885-9600

From: friessk8@att.net
To: Planning Department
Subject: Processing Plant
Date: Thursday, September 23, 2021 2:46:53 PM

I support the Carson Valley Meat processing plant as a resident of Gardnerville.

Sincerely

Lloyd Fries

From: Dixie Quandt
To: Planning Department
Subject: Carson Valley Meats Processing Facility
Date: Thursday, September 23, 2021 2:49:02 PM

Please approve CVM meat processing plant.
It is important to support local business, especially now.
Thank you

Dixie Quandt

From: Kimberlie Hassian
To: Planning Department
Subject: Meat Processing Plant
Date: Thursday, September 23, 2021 2:56:19 PM

Hello,

One thing that the pandemic has made painfully clear, is that we need more sources of reliable and healthy food!

Please support your local farmers and make a positive difference by approving the Carson Valley Meat processing plant.

Sincerely,

Kimberlie Hassian

From: Joyce Vannucci
To: Planning Department
Subject: Meats
Date: Thursday, September 23, 2021 3:11:38 PM

Pls allow local ranchers and farmers to sell their meats locally.
Tku
E J. Vannucci

Sent from my iPhone

From: Cathy Bombardier
To: Planning Department
Subject: Carson Valley Meat Plant
Date: Thursday, September 23, 2021 3:39:52 PM

I am in support of having the local meat plant, Carson Valley Meat Co.
Cathy Bombardier
961 Cavelti Rd
Gardnerville, Nv 89410
Sent from my iPhone

From: Gerry Varin
To: Planning Department
Subject: EMAIL OF SUPPORT
Date: Thursday, September 23, 2021 3:42:12 PM

I SUPPORT CARSON VALLEY MEATS APPLICATION FOR THEIR PROPOSED FACILITY IN CARSON CITY.

GERALD D VARIN
gerryvarin@yahoo.com
775-721-4911
Minden Nevada 89423

From: Matthew Nussbaumer
To: Planning Department
Subject: LU-2021-0308 Support the proposed special use.
Date: Thursday, September 23, 2021 5:59:18 PM

Planning Commission,

I wanted to voice my support of this proposed special use and new business. The service provided is of great value to this area and adjacent communities. The special use seems consistent with the current local uses and zoning and the negatives previously associated with a slaughterhouse are definitely manageable and appear to be addressed in the supporting documentation.

Please approve the SUP for this new small business. It provides a needed service and a new specialty retail service that will be great. The positives far outweigh the negatives.

Thanks for your consideration

Matt Nussbaumer
Carson City Resident

Sent from my iPhone

From: Suzanne Todd
To: Planning Department
Subject: In Support of Carson Valley Meats Project
Date: Thursday, September 23, 2021 7:32:06 PM

Dear Carson City Planning Commissioners,

The human connection to food has changed drastically in just the past two decades. The days of the neighborhood butcher shop where you could choose and purchase local meats and special cuts for your family seem a thing of the past. Now, you go to a supermarket and buy prepackaged whatever they have from wherever it came.

The proposal submitted by Carson Valley Meats appears to seek restoration of that lost connection, along with providing a much needed facility for processing for local ranchers. We see a multitude of benefits for the City, the ranchers, the community, and those who enjoy knowing the local butcher and where their food comes from.

We are in full support of the Carson Valley Meats processing plant proposal.

Sincerely,
Suzanne and Rick Todd

From: Carol Smith
To: Planning Department
Subject: Carson Valley Meats
Date: Thursday, September 23, 2021 9:13:49 PM

I have been purchasing products from and visiting the Sinclair family ranch near Auburn for a long time
They are all hard working and have high standards for animals and products
It will be a great addition to the Carson Valley to have this company located there
Carol Smith
teacher and humane animal farming advocate

Sent from my iPad

From: Kim Stephenson
To: Planning Department
Subject: support of meat packing building in Carson city
Date: Thursday, September 23, 2021 10:12:33 PM

The animals would not have to travel so far from local farms and this facility is going to practice humane handling procedures.
Kim Stephenson

From: bropsprops@aol.com
To: Planning Department
Subject: meat processing plant
Date: Friday, September 24, 2021 2:11:33 AM

Sirs;
I believe the council should give the go ahead permit to the building of a regional meat processing plant. Not only will it create new well paid jobs it will help facilitate a need local farmers have in meeting requests locally of providing quality fresh meat. Limiting time in transport to a processing plant will increase profits and keep local expenditures local. This is a win-win for all parties concerned.
Sincerely,
Charles Tombropoulos

From: Ray Sansom
To: Planning Department
Subject: Carson Valley Meat Processing Plant
Date: Friday, September 24, 2021 7:03:43 AM
Attachments: image001.png

This message originated outside of Carson City's email system. Use caution if this message contains attachments, links, or requests for information.

Dear folks of the Carson City Growth and Management Commission,

It has been brought to my attention that Carson Valley Meats is looking to open a new meat processing facility that will require your approval. Knowing Karin Sinclair for the last 15 years places me in a unique position to heartily endorse this venture. Karin has years of experience working with the community and providing an outlet for local agricultural growers and ranchers to market their wares. I have attended many successful community gatherings she has spearheaded all to the benefit of local farmers, ranchers and craftspeople. She has clearly illustrated her ability to bring people and events together proving time and time again her value as a champion for the community. She is a hardworking honest individual whose plan to open a Meat Processing Facility will only benefit the community. By approving her request you will not only be gaining a vital much needed service and business but you will also be strengthening the fellowship that runs throughout Carson by welcoming a proprietor of high standing that will reach beyond business and establish herself as a friend.

Respectfully,

Ray Sansom

Ray Sansom
A&A Concrete Supply
(530) 864 0291 Cell

From: Jerry Britton
To: Planning Department
Subject: Reply
Date: Thursday, September 23, 2021 4:14:08 PM

Yes, In support of this business.
Jerry Britton

From: Merlyn Paine
To: Heather Ferris
Subject: LU-2021-0308 Public Comment
Date: Thursday, September 23, 2021 6:42:07 PM

NO! This is near the highly economically important tourist launch area of the Virginia City railroad, near the remote miniature airplane launch site, and the office and retail area at the, beginning of Deer Run Road. The parcel across Highway 50 and across from Deer Run is also on the Pony Express route (The Pony Express Re-Ride) where tourists gather to see the exciting passing of the mail pouch to the next rider. In addition, the proposed site is close to Centennial Park where there are ongoing lighted and non-lighted ball games for adults and children, and it is right across the highway from a major area golf course. It should be noted that Deer Run Road leads right into the Pinion Hills Subdivision which is an expensive area of one-plus acre properties. Sunrise Drive also leads directly into a residential district with properties very close to the proposed slaughterhouse site and Highway 50 itself.

In short, this site is in the middle of high use recreation, residential and existing businesses, all of which are of high economic significance to the City. . The only reason I can imagine that the developer wants to put it here is that there is a near five-acre parcel available. If my memory is correct, this project was recently declined for development in the Dayton area.

This proposal is extremely inappropriate for this area of Carson City and approving this specific use for this area will significantly degrade the use and real estate value in business, homes, and recreation.

I told the neighborhood group: “You must send your public comment to "planning@carson.org", or via mail at Planning Division, 108 E. Proctor St., Carson City, NV, 89701, You can also email your comments to the Planning Commission to Heather Ferris, Planning Manager at hferris@carson.org up until 3:00 p.m. Tuesday, Sept. 28.. You can also attend and speak at the City meeting on September 29th at the Community. This proposal is designated as Item # LU-2021-0308.”

From: Katie Bregg
To: Planning Department
Subject: Carson Valley Meats New Meat Processing Plant
Date: Friday, September 24, 2021 9:31:08 AM

I am in total support of the Carson Valley Meats new meat processing plant! I think it is important to our community and it's growth.

Thank you,

Katie Bregg

From: Karen Polli
To: Planning Department
Subject: Carson Valley Meats
Date: Friday, September 24, 2021 12:20:50 PM

I encourage the planning commission approve the processing plant. This will get the food production line closer to the consumers. This small controlled company is the epitome of good food for consumers. Thank you

Sent from my iPhone

Fallon Food Hub
PO Box 1386
Fallon, NV 89407

September 24, 2021

Carson City Planning Commission
108 E. Proctor St.
Carson City, NV 89701

RE: Statement of Support for approval of Carson Valley Meats facility
Agenda item 13.ELU-2021-0308

I am writing to today to express my enthusiastic support for the approval of Carson Valley Meats application for construction of a meat processing facility along highway 50 in Carson City.

I am the executive director of a non-profit that supports farmers, ranchers, and other agricultural producers through the aggregation and distribution of their produce and products. In this position, I manage a local farm share program that allows individual consumers to receive regular deliveries of Nevada Grown veggies and animal proteins. We have a large and growing customer base in Carson City as well as regionally including in Fallon, Fernley, Sparks, Reno, Gardnerville, and Minden. During the pandemic, our program was key to ensuring the sustainability of farming operations through the duration of restaurant closures, ensured continued access to produce and protein for Nevada residents during industrial supply chain interruptions, and combatted food insecurity by connecting regional food pantries with agricultural producers in the region.

One of the many weaknesses that we identified in our regional food system during the pandemic was insufficient meat processing infrastructure in northern Nevada. The Carson Valley Meats processing facility will be an important asset for our food system by increasing access to slaughter and process for regional ranchers and by increasing access to locally raised and processed animal proteins for end consumers. The more self-sufficiency that we can build into our northern Nevada food system, the less of an impact we will collectively experience during future supply chain interruptions.

I am also writing to express my support, not just for meat processing facilities in general, but for Karin Sinclair and Mike Holcombe specifically! When Mike was the manager of the Wolf Pack Meats facility at UNR, that operation functioned extremely efficiently as both a training and educational operation AND as a meat processor. These applicants are pros! They know how to run a clean & sanitary facility, to efficiently contribute to our regional food security, and to be a critical partner to ranchers in the region.

I encourage you to approve their application!
Thank you,
Kelli Kelly
Executive Director – Fallon Food Hub
fallonfoodhub@gmail.com
775-234-8816

From: wickedwagens
To: Planning Department
Subject: Carson Valley Meat processing plant.
Date: Friday, September 24, 2021 1:26:20 PM

I am in support of this facility being approved. This is needed to preserve the agricultural character of the Carson Valley and Carson City, promote the education of future generations of ranchers, and support local ranchers and producers. By establishing a processing facility for local ranchers and livestock producers to process locally, our neighbors and surrounding communities may purchase regionally sourced meats.

Many local ranchers are struggling to get their animals harvested because the facilities around the region are full. It's a tremendous waste of energy for people to have to truck their animals miles away when we have the ability to do this right here in our backyard. The existing processing facilities in the region are booked solid, and it often creates a problem for ranchers who may not be ready in their pre-arranged appointment time, but have animals in who will be ready outside that time frame.

We really need this to support our down home roots and our community values.

Thank You,
Mark Ortiz

From:	Robert Buttner
To:	Planning Department
Subject:	Slaughterhouse in our neighborhood.
Date:	Friday, September 24, 2021 2:23:50 PM

I live at 4966 August Dr. in Carson and was just a little shocked to find out (2nd hand) from my neighbor of 61 years that there was a proposed SLAUGHTERHOUSE on the planning commission's agenda for Sept. 29. Although I understand the local ordnance only requires notice to adjacent properties of 300 ft. and the City extended the notification to 1,000 ft. considering the nature of this particular business it's a little disturbing that not everyone living within at least a quarter mile of the proposed site was notified.

That said, I have several issues with a slaughterhouse and stockyard in this area, or anywhere in Carson City for that matter.

1) The proposed location is not zoned for this type of business (hence the request for a special use permit).
2) There will be a huge property value impact on the residential area for a considerable distance.
3) The noise from a "Stock yard" is a significant change in the amount and type of noise experienced in this neighborhood. (EVER)
4) The smells and odors coming from a slaughterhouse/stockyard would certainly impact the quality of life for everyone for a considerable distance.
5) The flies generated from the acres of animal urine and dung will introduce a significantly objectional characteristic to the area.
6) Stockyards are well known to be notorious dust bowls, and the dust isn't just dirt.
7) The addition of heavy truck traffic will make entering Highway 50 from Sunrise Dr. even more treacherous than it is now.

A personal note. Having live in Carson since 1959, grownup here, graduated High school, volunteered in youth sports programs and resided on the same street nearly all that time, I've come to know a fair number of people in the area. I've mentioned this slaughterhouse proposal to a number of these friends and acquaintances and without exception the reply has been "Oh (#^@&) or Hell No). Many of these folks don't even live in my neighborhood but don't think a slaughterhouse/stockyard belongs anywhere in the city.

Thank you for your time and consideration.
I will attend the meeting on the 29th.

Respectfully,

Robert R. Buttner (Capt. Reno Fire Dept. Ret)

From: Patricia Palmer
To: Planning Department
Subject: Slaughter House
Date: Friday, September 24, 2021 2:48:43 PM

My husband and I would like to oppose the proposed Slaughterhouse that would be located on the South side of Highway 50, east of Detroit Road. We currently live approximately 3 miles from this location and have some concerns.

1. We are greatly concerned about our housing prices, having this type of establishment so close to our homes.
2. The odor that is generated from these types of establishments.
3. The noise this will cause
4. This is also a flood plain area which means whenever there are any floods there is potential and fear of fecal matter, other bodily fluids, and bacteria contaminating the river, and carrying over to surrounding homes and businesses.

Thank you for your time.

Patricia & Nick Palmer
Concerned Citizens

From: Public Comment
To: Planning Department
Subject: FW: Proposed Slaugter House
Date: Friday, September 24, 2021 4:08:36 PM

Please see public comment sent to the BOS to be included in your upcoming meeting.

Rachael Evanson | Office Specialist
Executive Office | Carson City, A Consolidated Municipality
201 N. Carson Street, Suite 2, Carson City, NV 89701
Direct: 775-283-7125 | Office: 775-887-2100 | Fax: 775-887-2286
http://www.carson.org

From: Sunni M <sunnibunni61@yahoo.com>
Sent: Friday, September 24, 2021 1:42 PM
To: Public Comment <PublicComment@carson.org>
Subject: Proposed Slaugter House

Hello. It is my experience that when a slaughter house is running, the smell is atrocious and the flies (usually including very large flies), are a given. They DO NOT stay within the business area so if there are homes in the vicinity, the residents and their pets will have to deal with the constant barrage of the the insects. It makes for a very bad living environment. And... will anyone driving in that area have to hold their nose as they drive by?

Thank you,
Judith Jones

From: Public Comment
To: Planning Department
Subject: FW: Carson Valley Meats
Date: Friday, September 24, 2021 4:09:18 PM

Please see public comment sent to the BOS to be included in your upcoming meeting.

Rachael Evanson | Office Specialist
Executive Office | Carson City, A Consolidated Municipality
201 N. Carson Street, Suite 2, Carson City, NV 89701
Direct: 775-283-7125 | Office: 775-887-2100 | Fax: 775-887-2286
http://www.carson.org

From: Michael Goldeen <magoldeen@earthlink.net>
Sent: Friday, September 24, 2021 12:07 PM
To: Public Comment <PublicComment@carson.org>
Subject: Carson Valley Meats

Provided adequate control of stench and effluent, I think Carson Valley Meats proposal for an abattoir a highly desirable use of resources. Locally owned. Serving a local market. Serving local suppliers. What could be more profitable?

Michael Goldeen
804 Lexington Avenue
Carson City, NV 89703

775-297-3688
michael@goldeen.com

From: Karl & Jean Baker
To: Heather Ferris
Subject: Carson Valley Meats
Date: Monday, September 27, 2021 7:44:11 AM

I am writing in support of this special permit request. I reviewed the staff prepared material and find all of the information favorable for this project to proceed. Carson Valley Meats, Karin Sinclair and team, have done their homework and due diligence on this project. The region will only benefit from this small scale USDA facility. With only a couple of USDA options in our area it is very difficult to get processing in a timely fashion. The other area facilities are typically booked many months ahead and in the case of Wolf Pack Meats...a year in advance!

The farm to fork movement has only gained traction with the rise of the pandemic. This merging of rural and suburban/urban communities brings us all together with mutual experience and understanding. The money stays local and the engagement stays local. Let's cut out the corporate big box store for once. Meat your farmer...pun intended.

Again, I support and respectfully ask you to grant this special use permit.

Thank you for your time.

Sincerely,
Karl Baker
Rancher on East slope of Sierra Nevada.
Doyle, Ca

From:	Dave Carbon
To:	Planning Department
Subject:	Carson Valley Meats
Date:	Saturday, September 25, 2021 8:09:28 AM

Dear Carson City Growth Management and Planning Commission:

I would like to take this opportunity to show support for the new meat processing plant being proposed by Carson Valley Meats.

I personally know the individuals involved in this venture and they are honest, hardworking people. They also have a great deal of knowledge and understanding of the cattle industry as to the raising and maintaining of healthy animals and the proper processing of such animals. They are not strangers to such and endeavor, as I am certain they have explained to you. There is no doubt the plan they've presented to you has been thoroughly thought through and all the "pluses and minuses" taken into consideration.

If local ranchers and livestock producers were asked, I feel certain they would support this proposal with the thought that their locally grown products could and would be going to many locally owned markets. There is no question in my mind that Nevadans will support Nevada industry. It is also my thought that this new plant would add something to the tax base in Carson County and perhaps offer a few new jobs to local people.

Thank you for taking the time to read my email and I sincerely hope you look favorably upon the proposal before you from Carson Valley Meats.

Have a nice day,
David J. Carbon

From: Randy Case
To: Planning Department
Subject: Slaughterhouse
Date: Saturday, September 25, 2021 7:27:17 AM

There are a long list of reasons why this should be denied. I will keep it short, and say that this is simply not a facility that should be so close to residential properties. Please review the Douglas commission and be respectful of residents.

Regards,
Randy Case

From: Jimmy Cassidy
To: Planning Department
Subject: LU-2021-0308 aka slaughter house
Date: Sunday, September 26, 2021 11:49:43 AM

good idea but bad location. James Cassidy 3064 Bowers Lane Carson City, Nv 89706

From: akaspuds@charter.net
To: Heather Ferris
Subject: RE: PC meeting
Date: Monday, September 27, 2021 7:36:35 AM

Heather

What I would like to pass on to the PC members concerning the slaughter house is:

@ Animals may only be harvested one day a week. Also only during business hours.

That part does not make sense if they can harvest 60 animals per week. That means 60 can be done in one day. For that to happen they will have to harvest 5 per hour to accomplish that in 12 hours -- 6am to 6pm. I am not aware of how this business works but 5 per hour seems like a lot especially if they are different types animals.

I would like to see more specific wording added to make sure it is understood animals may only be harvested during business hours. Unless I am missing something I do not see that clearly stated.

I also think this entire building should be fenced. There is always the danger of the animals getting out and if a cow wonders onto HWY 50 it may cause problems/accident.

The part about processing wild game should state wild game will be dead on arrival. If not then I would like to know what kind of live wild game will be housed there.

Thanks
Glenn Conant
Empire Ranch Estates

From: "Heather Ferris"
To: "akaspuds@charter.net"
Cc:
Sent: Thursday September 23 2021 12:29:52PM
Subject: RE: PC meeting

Glenn-

Hours of operation, including harvesting, are limited to 6 am – 6 pm. All harvesting, etc. will be conducted indoors.

Let me know if you have additional questions.

Heather

From: akaspuds@charter.net <akaspuds@charter.net>
Sent: Thursday, September 23, 2021 10:26 AM
To: Heather Ferris <HFerris@carson.org>
Subject: RE: PC meeting

Heather

I guess for me the only question I have is when the animals are harvested (slaughtered). It seems it will be in a 24 hour period but does not list the hours of operation for the harvesting. I do not know anything about slaughter houses but I am thinking they require the use if industrial equipment such a large saws which I know are very loud. I believe if that is the case it could be heard even if done indoors. My concern is being woken up at 2am to sounds of animals being sawed to pieces. Can the harvesting occur during the hours of operation 6am to 6pm? If they have 60 animals to harvest in 24 hours that seems like it would have to be done into the wee hours of the morning. Am I missing something?

Glenn

From: "Heather Ferris"
To: "akaspuds@charter.net"
Cc:
Sent: Thursday September 23 2021 11:25:32AM
Subject: RE: PC meeting

Glenn-

I've answered your specific questions below. I've also provided you with the link (see below) for the agenda, staff report and application packet. Please scroll down to Item 13 E, click the embedded link and it will take you to the staff report and supporting documentation.

09/29/2021 Growth Management and Planning Commission Agenda with Supporting Material | Carson City

1. Is this a noisy operation? Does it operate 24/7? It must use saws and loud equipment to cut the animals up?

During normal operations the applicant proposes processing no more than 60 animals (including beef, goat, lamb, and swine) per week with animals being on-site in the corral for no more than 24 hours prior to processing. Staff is proposing a condition (condition 15) limiting the operation to a maximum of 60 animals per week with animals on-site no more than 1 day per week for a maximum of 24 hours prior to harvesting. Additionally, the facility may process wild game. The entire harvesting process will occur indoors.

2. What about the smell? Is there a strong odor?

As noted above, a maximum of 60 animals per week with animals on-site no more than 1 day per week for a maximum of 24 hours prior to harvesting. Staff is recommending a condition of approval requiring manure and waste materials to be removed form the corral area weekly, within 24 hours following harvesting. The manure will not be allowed to accumulate on-site. The applicant will be required to haul the manure off-site and dispose of it properly.

3. Is this a good fit for this area? If Carson needs to spread out I would think this close to residents and other businesses a slaughterhouse is not such a good fit.

There are 7 required findings of fact that must be made in order to approve a special use permit. Staff addressed each of the findings in the staff report for the Planning Commission's consideration. Based on the proposed operation and the recommended conditions of approval, staff is recommending approval of the slaughterhouse. Additionally, the applicant is required to obtain and maintain all state and federal permits and licenses including a wastewater discharge permit from NDEP, a NV Department of Agriculture license to operate (NRS Chapter 583 license); and USDA permits.

I hope this helps to answer your questions. Please confirm whether or not you would like this correspondence to be forwarded to the Planning Commission for their consideration.

Thank you,

Heather

Heather Ferris

Planning Manager

108 E. Proctor Street

Carson City, NV 89701

775-283-7080

From: akaspuds@charter.net <akaspuds@charter.net>
Sent: Wednesday, September 22, 2021 6:58 PM
To: Heather Ferris <HFerris@carson.org>
Subject: PC meeting

Heather

For other reason we here at Empire Ranch look over the PC agenda each month. Several of the residents have questions concerning the slaughterhouse.

1. Is this a noisy operation? Does it operate 24/7? It must use saws and loud equipment to cut the animals up?

2. What about the smell? Is there a strong odor?

3. Is this a good fit for this area? If Carson needs to spread out I would think this close to residents and other businesses a slaughterhouse is not such a good fit.

We are not close enough to get a notice but we are close enough to smell it if there is an odor.

Thanks

Glenn Conant

From:	Diane Howard
To:	Planning Department
Cc:	Heather Ferris
Subject:	LU-2021-0308 Special Use Permit for a Slaughterhouse on Hwy 50 E
Date:	Sunday, September 26, 2021 2:40:56 PM

Planning Commission,

I am writing to express opposition to LU-2021-0308 for a Special Use Permit for a Slaughterhouse on the south side of Hwy 50 E and east of Detroit Road.

Please deny the special use permit.

You can not make Finding #2 as listed on page 7 of the staff report as a slaughterhouse located 913 feet from my home will be detrimental to the peaceful enjoyment of my property.

Sincerely,

Diane Howard
4990 August Drive
Carson City, NV 89701

From: Linda Enteles
To: Planning Department
Subject: Meat processing facility
Date: Sunday, September 26, 2021 3:47:09 PM

I would most certainly be in favor of Carson Valley Meats being granted the right to have a meat processing facility. This is long overdo and would be an absolute gift to those of us who wish to buy locally produced and raised meat.
I do hope this becomes a reality.
Linda Enteles
7757229439

From: Dawn Escalona
To: Planning Department
Subject: Supporting Carson Valley Meats Request for Special Use Permit
Date: Monday, September 27, 2021 9:59:11 AM

Hello,

I am a resident of the Reno-Tahoe area and a satisfied customer of Carson Valley Meats. I have read through the farm's proposition for a Special Use Permit, and I would like to show my support for their effort. I will not be in attendance due to my work schedule, but I still wanted to show that I am in favor of this request.

Thank you for your time and attention,

Dawn Escalona

From: Kimberly Everett
To: Heather Ferris
Subject: Proposed slaughter house
Date: Sunday, September 26, 2021 5:59:59 PM

I strongly appose the location of a slaughterhouse within 25 miles of Carson City. I grew up in the Midwest and any type of kill or meat processing of animals produces a horrendous smell/stench that modern science cannot hide nor remedy. If Iowa and Nebraska couldn't find a way to eliminate the horrible smell, what makes you think this will be any different? There's always that one business that says trust me if I guarantee but is not credible and can never make things right.
I say no to a slaughterhouse!

Kimberly Everett
466 Cambridge Court
Carson City

Sent from my iPhone

From: Dale Fleischhacker
To: Planning Department
Subject: Slaughterhouse
Date: Sunday, September 26, 2021 12:02:53 PM

Dear Carson Planning Comittee.

The capital of Nevada is NOT the city to be transferring cows all around or have a major build reeking of blood and death.
Thank you for listening to my concerns, sincerely Dale F.

From: Jeremiah Fred
To: Planning Department
Subject: Slaughterhouse on Highway 50
Date: Sunday, September 26, 2021 3:59:01 PM

I live in the neighborhood across the proposed sight of the slaughterhouse. My concern is the sounds of the killing of animals, the stench of the remains of slaughtered animals, the poop smell, and the possible loss of my property value due to all the items mentioned above of the proposed business. After researching online about neighbors of slaughterhouses there does not seem to be any good. It seems that if the commissioners in Gardnerville rejected the idea in a less populated area, then why would we even suggest it in an area full of homeowners. May I suggest an alternate area such as the landfill since that is what it will smell like. I will fight this to the end I didn't buy my house in a slaughterhouse area nor do I want to live in a slaughterhouse neighborhood. Maybe the slaughterhouse can buy all are properties at 3x the amount since they want to ruin my nice neighborhood.

From:	Diane Howard
To:	Planning Department
Cc:	Heather Ferris
Subject:	LU-2021-0308 Special Use Permit for a Slaughterhouse on Hwy 50 E
Date:	Sunday, September 26, 2021 3:07:47 PM

Planning Commission,

I am writing to express opposition to LU-2021-0308 for a Special Use Permit for a Slaughterhouse on the south side of Hwy 50 E and east of Detroit Road.

I was born and raised in Carson City and have lived here for 86 years. My wife and I have lived at 4990 August Drive for 60 years. My father was born in the City of Empire, which at the time, was right across the highway from where we live now, and just west of the proposed slaughterhouse property. My great-grandfather was born several miles east at Brunswick Mill. They and my great-great-grandfather are buried in Empire Cemetery, on the hill, 400 feet southeast of the slaughterhouse property.

We are local.

In my lifetime I have seen the Carson River flood from the area directly south of the slaughterhouse property, all the way to Highway 50. My grandfather lived in Empire City and had a photograph of the damage from the flood.

Please deny the special use permit.

George Howard
4990 August Drive
Carson City, NV 89701

From: LuAnn James
To: Planning Department
Subject: Slaughterhouse 50
Date: Sunday, September 26, 2021 1:33:35 PM

I agree that smaller slaughterhouses/meat packing plants are an important business and would be happy to see all of the horrible industrialized meat packing plants replaced by smaller ones,

BUT THEY SHOULD NOT BE WITHIN CITY LIMITIS OF ANY CITY, LARGE OR SMALL.

NEAR RESIDENTS, RICH OR POOR.

The proposed site is near the river, likely in a flood zone.

[This is near the highly economically important tourist launch area of the Virginia City railroad, near the remote miniature airplane launch site, the office and retail area at the, beginning of Deer Run Road. The parcel across Highway 50 across from Deer Run is also on the Pony Express route (The Pony Express Re-Ride) where tourists gather to see the exciting passing of the mail pouch to the next rider. In addition, the proposed site is close to Centennial Park where there are ongoing lighted and non-lighted ball games at the Park for adults and children, and it is right across the highway from a major area golf course. It should be noted that Deer Run Road leads right into the Pinion Hills Subdivision which is an expensive area of one-plus acre properties. Sunrise Drive also leads directly into a residential district with properties very close to the proposed slaughterhouse site and Highway 50 itself. In short, this site is in the middle of high use recreation, residential and existing businesses, all of which is of high economic significance to the City. . The only reason I can imagine that the developer wants to put it here is that there is a large parcel available. If my memory is correct, this project was recently declined for development in the Dayton area.*] – Merlyn Paine, Riverview

AND Minden.

Please send a clear message to Sinclair that their business is not welcome within city limits of Nevada cities.

LuAnn James

16 Milliman Way

Carson City, NV 89706

--
Ann James
https://medium.com/@annjames_20427

From: Jennifer Verive
To: Planning Department
Cc: Bob Buttner
Subject: Joint Letter in OPPOSITION to the proposed Slaughterhouse
Date: Sunday, September 26, 2021 2:55:12 PM

Dear Planning Committee Commissioners:

According to Title 18 of our City's Municipal Code, the purpose of the Planning Commission is to promote the health, safety, and welfare of Carson City's citizens.

We represent an East Side neighborhood that is adjacent to the proposed slaughterhouse (Item 13.3 LU-2021-0308 on the Agenda for the Planning Commission meeting on 9/29/21). We are writing to urge you to DENY this application.

FIRST, we are asking you to deny the application because it is incomplete.

We understand that our city staff are hardworking and tenacious. However, we are concerned with some of the language in the Report that we find ambiguous and thus potentially dangerous to the health, safety, and welfare of our citizens.

On page 217 of the Staff Report it states, "A maximum of six times per year, additional animals may be processed to serve the needs of local events. To accommodate these events, harvesting may occur a maximum of 3 consecutive days with a maximum of 120 animals on-site at any one time."

One concern is that there is no definition of "LOCAL EVENT". Who gets to determine what constitutes "local" and an "event"? Is it up to Carson Valley Meats and their customers to determine that? For example, if they have a few customers that want to harvest meat and it happens to be during our Jazz & Beyond Festival, what prevents them from saying they are doing additional harvesting because of this local festival?

Another concern is that although "six times a year" is specific it also does not denote frequency – is this every other month? Could there be one month where the slaughterhouse is harvesting animals every single day? If that is during Thanksgiving or Christmas, when people tend to consume more meat, then the stench and noise from the meat harvesting will most definitely negatively affect our ability to peacefully enjoy our homes and community over the holidays.

In essence, our concern is that the ambiguity of the language enables Carson Valley Meats to harvest whenever they wish simply by designating the work as related to a "local event". This alone is sufficient reason to deny this special use permit.

SECOND, we are asking you to deny this application because it will harm our community.

Based on our extensive research, we are certain that the proposed slaughterhouse, by being located where proposed, will have a significant negative impact on the health, safety, and welfare of our citizens.

We have gathered over a dozen studies – some from academic, peer-reviewed journals and some from community-based research in communities like our own— and the evidence is overwhelmingly on our side:

#1: The Community Does NOT Support This Project!

#2: This is NOT About "Demand" – It's About LOCATION

#3: Property Values Will Decrease by 26% (at minimum!)

#4: Economic Vitality Will Decrease

#5: Arrests for Rape, Sexual Assault, & Family Violence Will Increase

#6: Carson City Residents Will Get Sick and Stay Sick

#7: Our AIR Will Be Polluted 24/7 – ODOR & DUST

#8: Our WATER Will Be Polluted 24/7

#9: There Will Be Objectionable Noise – Sounds "Like Killing Babies"

Evidence for these harmful effects is detailed in a letter emailed to planning@carson.org by Dr. Verive. She also attached these studies and other supporting documentation for your review.

In conclusion, the proposed slaughterhouse WILL significantly negatively affect the use, peaceful enjoyment, economic value, and development of surrounding properties and the general neighborhood; and it WILL cause objectionable noise, vibrations, fumes, odors, dust, glare and physical activity.

For all of these reasons, we respectfully urge you to DENY this special use permit

request.

Sincerely,

Robert Buttner, Capt. Reno Fire Dept. (Ret.)
Jennifer Verive, Ph.D.

From:	Jennifer Verive
To:	Planning Department
Subject:	Letter and materials in OPPOSITION to the proposed SLAUGHTERHOUSE
Date:	Sunday, September 26, 2021 2:25:35 PM
Attachments:	Verive.Letter Opposing Slaughterhouse.9.26.21.pdf The Psychological Impact of Slaughterhouse Employment A Systematic Literature Review - Jessica Slade, Emma Alleyne, 2021.pdf What"s that smell Life near Toronto"s downtown slaughterhouse - CityNews Toronto.pdf Living with hogs 2003.pdf SLAUGHTERHOUSE NEIGHBORS LONG FOR SILENCE OF THE GOATS - The Morning Call.pdf Slaughterhouses and Increased Crime Rates.pdf Neighbors Sue ZBA Over Approved Slaughterhouse - Easton Courier.pdf Noise assessment in slaughterhouses by means of a smartphone app.pdf Slaughterhouse plans draw out supporters, opponents Powell Tribune.pdf Common Manure Test Results Conversions – Livestock and Poultry Environmental Learning Community.pdf animaloperationsJKwinter2015.pdf

(I have attached a PDF of this email letter for your convenience. Also attached are supporting materials for the facts and statistics described in my letter).

Dear Madam Mayor, Supervisors, and Commissioners:

I am writing in response to Item 13.3 LU-2021-0308 on the Agenda for the Planning Commission meeting on 9/29/21. As Planning Committee Commissioners are appointed by the Board of Supervisors and/or a particular Supervisor, I believe it is important that you are all made aware of critical information relevant to this agenda item – information that supports the conclusion that locating a slaughterhouse within our City (County) limits will have major negative impacts on County revenues, tourism, and quality of life for our citizens.

As a resident located on August Dr., two houses down from the “cutoff” required for the Official Notice of Public Hearing, I am horrified and scared by the prospect of having a slaughterhouse within a quarter mile of my home and in direct line of sight from my daughter’s school bus stop. As a recently divorced, formerly stay-at-home mother, who teaches part time at Western Nevada College, my only asset is my home. My quality of life, as well as my daughter’s, and my elderly father’s (he lives with me), is directly in the ‘line of fire’ of the proposed slaughterhouse. This is an intensely personal matter – but also one with much broader implications not only for my neighborhood, but for our community.

As a trained researcher, I did what I do best – I researched. I found that slaughterhouses and their impact on communities is a well-documented topic. All the studies I found, whether they were peer-reviewed, academic research or community-based surveys, determined that having a slaughterhouse in one’s community leads only to negative outcomes for individual citizens, neighborhoods, and the community overall. I have attached several of these studies to this email.

My conclusion was that the proposed slaughterhouse will significantly harm our community by decreasing revenue, stunting growth and tourism, increasing crime, introducing significant air and water pollution, and harming the health and well-being of our citizens.

The proposed slaughterhouse <u>WILL</u> significantly negatively affect the use,

peaceful enjoyment, economic value, and development of surrounding properties and the general neighborhood; and it WILL cause objectionable noise, vibrations, fumes, odors, dust, glare and physical activity.

Because of the evidence-supported reasons listed below, I strongly urge you to DENY this request for a special use permit.

#1: The Community Does NOT Support This Project!

Carson Valley Meats may have "customer" support, but despite the statements made in their press release, they do not have "community support" for this project. In fact, Carson Valley Meats failed to do due diligence with the hundreds of citizens living in residential neighborhoods near the proposed location – the only contact we had was the required Official Notice of Public Hearing.

Further, Carson Valley Meats is in Gardnerville. They already tried to build their slaughterhouse there and failed because the community did not support it.

Disregarding this strong and clear community voice, Carson Valley Meats then chose to sue Douglas County. They lost. And now they are here in our community.

My research found that the main interaction between slaughterhouses and their owners and the "community" is when the slaughterhouses are the subject of successful litigation by residents who are harmed by these facilities.

#2: This is NOT About "Demand" – It's About LOCATION

Whether there is or isn't demand for a slaughterhouse is tangential to the issue at hand – which is a request for a SPECIAL use permit regarding the location of the facility. This request is required because common sense tells us that slaughterhouses do not belong within City limits, but rather in non-residential areas.

First, when this same type of permit is denied in Douglas County – a county with a great deal more ranches and animals and thus higher demand for a slaughterhouse – the point about this being about LOCATION is clear.

Second, contrary to the claim by the Carson Valley Meats application, residential neighborhoods and a variety of citizen activities will be affected by the proposed slaughterhouse. The proposed location is only 900 feet from a neighborhood -- that is less than a quarter mile! Additionally, the harmful outcomes from slaughterhouses are felt by people and properties as far out as 3 miles from the facility. The proposed slaughterhouse is within a 2-mile radius of hundreds of residences, dozens of businesses, two golf courses, an elementary school, and the animal shelter.

Third, the location of this slaughterhouse sits at the ONLY **Eastern Gateway** into our City, along a historic, heavily used highway frequented by locals and tourists – who will, if you approve this special use permit, be greeted by a strong stench of feces, dust filled with fecal particles, and the loud noises of the stressed vocalizations of animals awaiting slaughter.

Is this the message we want to send to folks coming into town from Fallon or Dayton or farther for a Wine Walk or classic car show? Is this the experience we look forward to when we take our children, snuggled in their pajamas, to meet Santa and ride on the Polar Express?

Finally, in today's world, **most** communities are strongly opposed to having a slaughterhouse in their neighborhoods. In fact, this past June, one community in Connecticut filed a lawsuit against their Zoning Board of Appeals because the Board

approved such a facility.

The people of Carson City and across the U.S. are in agreement -- slaughterhouses belong in non-residential areas, far away from the places citizens live and recreate.

#3: Property Values Will Decrease by 26% (at minimum!)

There is a great deal of evidence showing that slaughterhouses depress real estate values and transactions. Usually, this research is done within 3 MILES of a facility. The location of the proposed slaughterhouse is only 900 FEET from a residential neighborhood – that is about two tenths of a mile!

Homes near slaughterhouses (within 3 miles) can expect their property values to decrease by 26%, and properties abutting the slaughterhouse will see their property values decline by as much as 88%.

A 26% decrease in the value of my home would be a financial disaster, as it would be for many of my neighbors. 26% is an impactful number – Would you like your investments to go down by 26%? How about your paycheck? Your lifespan?

The presence of a slaughterhouse is, in real estate parlance, a “negative externality”, which is generally considered NOT “economically curable” – that means we’re stuck with it and the stigma of trying to sell a home next to a slaughterhouse.

Research on communities across the country shows a decrease in property tax values ranging from **18% to 40%.** Residents often litigate this matter – and win.

#4: Economic Vitality Will Decrease

Regardless of whether you eat meat or not, the fact is that NO ONE wants a slaughterhouse in their backyard. Citizens and tourists are sure to alter their plans to avoid the odor, noise, and air pollution produced by the slaughterhouse. Citizens will divert to Arrowhead Road and Deer Run Road to avoid this patch of Hwy 50 (including the drainage from the proposed plant that runs off towards the highway).

The businesses along this part of Hwy 50 will lose customers and the neighborhoods along Arrowhead and Deer Run will see increased “thru traffic” – putting a burden on streets meant for local use only.

Additionally, it’s likely that tourists will choose alternate routes when possible and perhaps decide not to visit Dayton and Fallon. Thus, the proposed slaughterhouse will have a negative impact on our neighboring communities as well.

#5: Arrests for Rape, Sexual Assault, & Family Violence Will Increase

As a mother of a 15-year-old daughter, I was stunned to find sound, peer-reviewed research demonstrating that slaughterhouse employment, especially at smaller custom facilities, is directly related to increased rates of arrests for rape, sex offenses, domestic violence, and other family-related crimes (violent and non-violent) (Fitzgerald et al., 2009). I’ve attached these studies for your review.

The fact is that there is a great deal of research on the harmful effects of slaughterhouse work on its employees. (There is also a great deal of individual and class-action litigation regarding these effects – workers, their unions, and others have sued on the behalf of these workers.)

A 2021 study found that slaughterhouse workers “*have a higher prevalence rate of mental health issues, in particular depression and anxiety, in addition to violence-supportive attitudes…the research reviewed has shown a link between*

slaughterhouse work and antisocial behavior generally and sexual offending specifically."

Yes. The evidence shows that putting a slaughterhouse in our City will increase rapes, sexual assaults, and violence within families. In a community of our size, even the small number of employees proposed by Carson Valley Meats will have a significant impact. And is yet another reason for locals and tourists to avoid the businesses adjacent to the facility.

#6: Carson City Residents Will Get Sick and Stay Sick

Human health will be severely negatively impacted by the proposed slaughterhouse. Our physical and emotional health will suffer due to air and water contamination from the manure of 60 to 120 animals. Additionally, slaughterhouses attract flies and other insects, often "carrying resistant strains of **pathogens**" and parasites.

There has been a lot of research on people who live near slaughterhouses and other animal facilities. Research shows that folks living within TWO MILES of this type of facility have suffered "*headache, runny nose, sore throat, excessive coughing, diarrhea, burning eyes…increases in eye and upper respiratory infections…and acute and chronic respiratory disease…".*

Studies on the "spatial hedonics" of these sorts of facilities have found that within THREE miles there is an 18% negative impact on health, within ONE mile – the negative health impact is 23.5%.

These are real and documented health situations that are known mainly because of litigation – where residents successfully sued meat processing companies and their owners.

#7: Our AIR Will Be Polluted 24/7 – ODOR & DUST

The proposed facility will produce a strong odor due to the ammonia, hydrogen sulfide, and methane produced by the animals. The air will be filled with particulate matter from manure (aka "fertilizer").

The proposed design makes **NO** mention of any air filtration systems

The assertion by Carson Valley Meats that there will be no objectionable odor, noise, and dust because there are "only" 60 animals is misleading.

First, 60 animals produce a lot of waste. Research shows that "one hog excretes nearly three gallons of waste per day or 2.5 times the average human's daily total." (Hopey, 2003). One gallon of animal waste weighs about 8.5 lbs (Livestock and Poultry Environmental Learning Community Administration, 2019). Let's do the math: 1 gallon of waste = 8.5 lbs, 3 gallons of waste/day for ONE hog = 25.5 lbs a day; 60 sows = 25.5lbs x 60 = 1,530 lbs = .765 tons – **almost 1 TON of manure in ONE DAY!**

How quickly the manure is cleaned up is **NOT** a safeguard for public health. EVERY day that manure is present will cause a stench and spew fecal matter into the air.

Further, research shows that slaughterhouses and other animal operations often violate the standards and regulations they are supposed to follow (hence the high litigation rate). The Staff Report makes **NO** mention of any oversight or regulatory enforcement activities by the City.

#8: Our WATER Will Be Polluted 24/7

Groundwater and surface water contamination will result from the blood and fecal matter produced by the proposed slaughterhouse.

The Center for Biological Diversity (2019) reports that in 2019 *"twelve conservation and community groups representing millions of people sued the U.S. Environmental Protection Agency…for its decision not to update national standards restricting water pollution from slaughterhouses."* Thus, Staff's reliance on federal agencies to protect us **NOT** sufficient.

The proposed slaughterhouse is located adjacent to the Carson River and will be using City utilities such as sewer and water. The Center for Biological Diversity (2019) reports that "*Meat-processing plants discharge water contaminated with blood, oil, grease and fats. This wastewater contains nitrogen and phosphorus pollution, pathogens and other contaminants. When released into waterways, pollution from slaughterhouses can cause algae blooms that suffocate aquatic life and turn waterways into bacteria-laden public health hazards."*

The Water System Report submitted by Carson Valley Meats does **NOT** address these water-related issues. It merely states that water will flow in and out of the proposed design meets standards. The problem is not the flow – it's what's in the flow. The report from Manhard Consulting focuses on drainage from the detention ponds during storm events. There is **NO** information in the special use permit application that speaks directly to the pollutants that will be in the water and how they will be filtered out. Utilizing the City sewer system means that these pollutants will be made available to our entire community.

#9: There Will Be Objectionable Noise – Sounds "Like Killing Babies"

Noise is a significant factor that affects real estate transactions and property values. It is well-known that slaughterhouses are noisy in terms of high decibel levels. Much research has been done on this, finding noise up to 95.2 decibels – in the "Very Loud Range" (dangerous for over 30 minutes) (Iulietto et al., 2018).

Slaughterhouses are also notorious in the quality of the noise – often described as "screaming", popularized by the movie, "Silence of the Lambs". One resident who lives near a slaughterhouse in Pennsylvania said, "It sounds like they're killing babies." (White, 2000). The residents of that PA neighborhood were forced to litigate the matter – they won.

Although harvesting for the proposed slaughterhouse will be done inside a building, the Carson Valley Meats application makes **NO** mention of *any* noise mitigation measures other than the building itself. The vague design description mentions NO soundproofing or other measures for the harvesting areas nor for the holding areas.

IN CONCLUSION: Please Deny the Request for a Special Use Permit!

The evidence is clear. The harmful effects from slaughterhouses are well-documented and well-litigated. The proposed slaughterhouse may well benefit a few of our citizens – and it most certainly will have a significant **negative** effect on **ALL** of our citizens.

Carson City will experience a major decrease in revenue and quality of life by granting this special use permit. As Carson Valley Meats turns a profit, our citizens will suffer significant decreases in quality of life and physical and mental health, and our community will lose major tax, growth, and tourism revenues.

I urge you to deny this request: Don't slaughter our neighborhood! Don't slaughter our community!

Sincerely,

Jennifer M. Verive, Ph.D.

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Jennifer M. Verive, Ph.D.
Mobile: 775.315.4748
https://www.linkedin.com/in/jenniferverive

*she/her/hers

Trauma, Violence, & Abuse

The Psychological Impact of Slaughterhouse Employment: A Systematic Literature Review

Jessica Slade, Emma Alleyne

First Published July 7, 2021 | Review Article | Find in PubMed
https://doi.org/10.1177/15248380211030243

Abstract

The role of a slaughterhouse worker (SHW) involves the authorized killing of living beings, yet there is limited understanding of the consequences this behavior has on their well-being. The purpose of this systematic review is to collate and evaluate the current literature on the psychological impact of slaughterhouse employment. Fourteen studies met the specific a priori inclusion criteria. The findings from this review were demarcated by the focus of studies: (1) the prevalence of mental health disorders, (2) the types of coping mechanisms used, and (3) the link between slaughterhouse employment and crime perpetration. It was found that SHWs have a higher prevalence rate of mental health issues, in particular depression and anxiety, in addition to violence-supportive attitudes. Furthermore, the workers employ a variety of both adaptive and maladaptive strategies to cope with the workplace environment and associated stressors. Finally, there is some evidence that slaughterhouse work is associated with increased crime levels. The research reviewed has shown a link between slaughterhouse work and antisocial behavior generally and sexual offending specifically. There was no support for such an association with violent crimes, however. Based on existing research, we suggest future directions for research (i.e., applying more methodological rigor) but highlight key findings for practitioners and policymakers that warrant attention.

Keywords

slaughterhouse worker, mental health, depression, anxiety, crime, coping mechanisms

There are specific types of employment that require the authorized killing of living beings. Given the traumatic nature of this work, there has been research investigating the psychological impact, but only in a subset of professions (e.g., war veterans [MacNair, 2002], veterinarians, and researchers who conduct experiments on animals [Bennett & Rohlf, 2005]). However, very little is known about the consequences of working in slaughterhouses (also known as abattoirs). Slaughterhouse workers (SHWs) are involved in the deaths of more than 70 billion animals each year worldwide (Sanders, 2018). In order to meet market demand, the meat industry employs a workforce of approximately 75,000 people (British Meat Processors Association, 2019) in approximately 250 slaughterhouses in the United Kingdom (Department for Environment Food & Rural Affairs, 2019), with equivalent numbers in the United States (United States Department of Agriculture, 2020). Furthermore, statistics show that the majority of these employees have limited educational attainment and come from a low socioeconomic background (Victor & Barnard, 2016), with migrants making up 70% of the workforce in the United Kingdom (British Meat Processors Association, 2019).

There has been increased media coverage of the slaughterhouse industry as a result of the dissemination of online videos showing slaughterhouse staff abusing animals. Examples include using animals as a surface to extinguish cigarettes, decapitating animals and ridiculing their dismembered bodies, and inflicting abuse on animals as a form of game playing and entertainment (Animal Aid, 2015; Nagesh, 2017). In the United Kingdom, these videos prompted a change in legislation, whereby slaughterhouse establishments were required to install closed-circuit television (CCTV) to act as a deterrence, and if needed, to aid investigations (Embury-Dennis, 2018). However, animals are not the only victims of the slaughterhouse industry. Modern-day slaughterhouses prosper as a result of the industrialization of the production line (Hendrix & Brooks Dollar, 2017). Consequently, this puts immense pressure on the workers to keep up with such high demand (Dillard, 2008) resulting in violations of workplace policies (e.g., SHWs being denied bathroom breaks—Oxfam America, 2016; drug use to meet high production line demand—Hendrix & Brooks Dollar, 2017). Employment statistics, in addition to reports of high turnover (Fitzgerald, 2010), underline the need to better understand both short-term and longer-term psychological effects of working in such environments. Therefore, in the first instance, a consolidation of existing research findings, in the form of a systematic review, gives a springboard to build an evidence base that can inform practice and policy.

Before we embark on this review, we define a “slaughterhouse worker” to be an individual who works in a facility that kills and processes farmed animals for the consumption of meat. In the context of this form of employment, SHWs are exposed to serious risk of

injury (Leibler & Perry, 2016), with amputations occurring, on average, twice per week in the United States (Wasley et al., 2018). Risk of injury is often attributed to the poor working conditions within slaughterhouses. For example, SHWs are often asked to work long shifts in cold, damp, and noisy environments (Campbell, 1999; Harmse et al., 2016; Human Rights Watch, 2004), with inadequate hygiene facilities (Cook et al., 2017). Furthermore, it has been argued that facilitating or observing the cutting, skinning, and boiling of conscious or unconscious animals can cause psychological distress (i.e., cognitive dissonance) on the workers (Eisnitz, 1997; Hendrix & Brooks Dollar, 2017). For example, there is a growing body of evidence that SHWs exhibit symptoms of post-traumatic stress disorder (PTSD) warranting clinical attention (Beirne, 2004). This has been further characterized as perpetration-induced traumatic stress, which is a form of PTSD where the person is involved (or believes they are involved) in creating the traumatic situation (MacNair, 2002). The resulting symptomatology—such as substance abuse, anxiety, nightmares, and depression—is debilitating. Nonetheless, the psychopathological consequences typically result in one of two outcomes. SHWs often attempt to attenuate the cognitive dissonance using maladaptive regulatory strategies (e.g., substance abuse, ruminative thinking) to enable them to perform their duties (Dillard, 2008; Niven et al., 2012). Alternatively, if the dissonance and psychological effects overcome coping strategies, SHWs come to the attention of mental health services (e.g., psychiatric inpatient services; Newkey-Burden, 2020).

The state of the literature on the psychological effects of slaughterhouse employment currently lacks a framework to point toward that outlines meaningful (theoretical and practical) assertions regarding the underlying mechanisms that facilitate poor mental health outcomes for the workers. This systematic review is timely because it gives the opportunity to take stock of the existing evidence and conceptualize research directions moving forward. Therefore, in an effort to orient researchers and identify gaps for future study, the purpose of this systematic review is to consolidate, synthesize, and evaluate the current literature on the psychological effects of working in slaughterhouses. Considering the findings gleaned from the existing body of research, we will also outline a framework for future research to further evidence the processes and mechanisms between workplace-facilitated trauma and its psychopathological consequences.

Method

Inclusion Criteria

The studies selected for inclusion criteria were those that examined any psychological aspect of slaughterhouse employment. Psychological effects were conceptualized as relating to any aspect of mental health, social and cognitive domains, and interpersonal relationships. The focus of the selected studies was purposely kept broad due to the scarcity of research. In order to be selected for final inclusion, studies were required to meet the following set of a priori criteria: (1) the focus of the study was to examine any of the psychological effects described previously, (2) written in (or translated to) English, (3) the article presented an empirical (quantitative or qualitative) study, rather than a review or theoretical argument, to enable sufficient quality appraisals. In addition to the inclusion criteria, the literature search was designed to capture both peer-reviewed and unpublished research to avoid publication bias (Trespidi et al., 2011).

Document Search and Extraction

This review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement for reporting (Moher et al., 2009). A literature search was conducted across the following databases: Academic search complete, PsychArticles, PsychInfo, Scopus, and ProQuest Global Thesis Repository. The keywords used in the searches included slaughterhouse worker and “meatpacking worker.”

The initial search generated 563 articles, with 485 remaining after duplicates were removed. After the titles and abstracts were examined against the a priori inclusion criteria, there were 30 remaining full-text manuscripts. Five additional journal articles were identified from the reference list of the 30 articles. No further articles were identified through contact with experts. Fourteen full-text articles met the inclusion criteria and were included in the review (see Figure 1 for study selection flowchart).

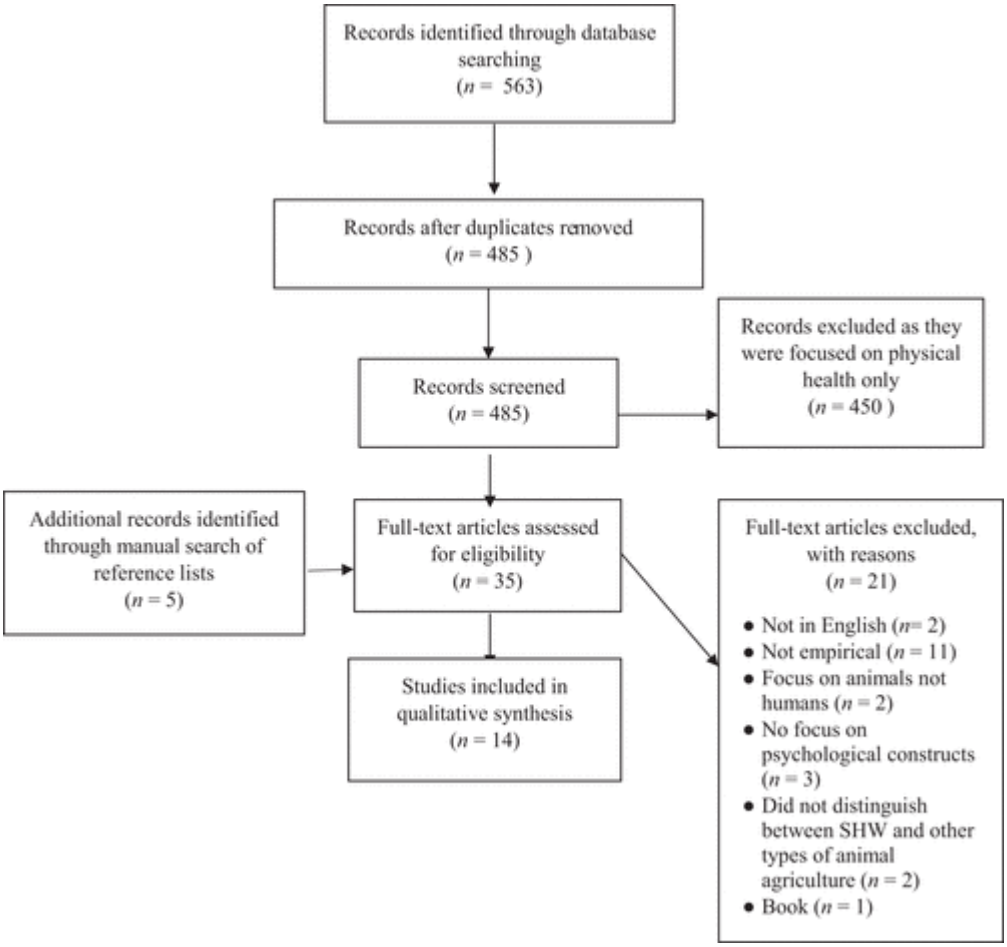

Figure 1. Flowchart of the literature search and study selection process.

Quality Appraisal

Two appraisal tools were used to provide a systematic method of assessing the quality of the studies. Qualitative papers were assessed using the Critical Appraisal Skills Programme (2016). Quantitative papers were assessed using the Quality Assessment Tool for Quantitative Studies (Thomas et al., 1998).

Results

Samples and Recruitment

Table 1 shows the details of the 14 studies used in this review. Half of the studies recruited participants from the United States (*n* = 7, 50%), the others recruited participants from the following countries: Australia, Brazil, Denmark, Ireland, South Africa, and Turkey. For the studies that examined SHWs (*n* = 12), there was a large variation in sample size, with a mean sample of 506 SHWs (minimum = 13, maximum = 4,407). Two studies used the same sample; that is, the study conducted by Horton and Lipscomb (2011) was a

longitudinal analysis of Lipscomb and colleagues' (2007) original study. The review included all-female studies (*n* = 2, 14%), all-male studies (*n* = 4, 29%), and mixed gender studies (*n* = 6, 43%). All of the studies used adult samples who were recruited through the following methods: internally (*n* = 2), placing adverts inside the slaughterhouse (*n* = 2), using community workers to circumvent the need to involve their employers (*n* = 2), national cohort (*n* = 2), snowballing techniques through personal connections (*n* = 1), and two papers did not specify. Three studies did not recruit participants: Two used secondary data and one used participant observation.

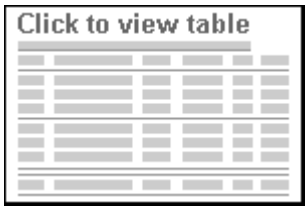

Table 1. Details of Studies Included in the Systematic Review.

The majority of studies examined slaughterhouses that processed cattle (*n* = 5, 36%), whereas the others were poultry (*n* = 3, 21%) and pork (*n* = 1, 7%) establishments. Fitzgerald et al. (2009) used both cattle and pork and excluded poultry. Four papers did not specify (29%) which animals were processed. Furthermore, seven papers (50%) specified which role the workers had in the slaughterhouse process, of which three focused exclusively on workers on the kill floor (21%) and the rest compared the kill floor to other positions.

Study Focus and Design

Most of the studies (*n* = 8, 57%) focused on the prevalence of mental health issues within slaughterhouse employees, four examined how SHWs cope with aspects of their employment (29%), and two studies examined the link between slaughterhouse employment and crime (14%). Within those which focused on mental health, one paper was actually focused on the physical health of its participants but examined depression as a risk factor for future injury (7%; Lander et al., 2016). Seven articles (50%) shared the hypothesis that the intentional killing or dismemberment of animals would have an impact on their well-being, in particular: general well-being (Baran et al., 2016), or linked with depression (Emhan et al., 2012; Horton & Lipscomb, 2011; Hutz et al., 2013; Lipscomb et al., 2007), anxiety (Emhan et al., 2012; Hutz et al., 2013; Leibler et al., 2017), and psychosis (Emhan et al., 2012). Two studies examined aspects of SHWs' mental health which may have an impact on interpersonal relations such as anger and hostility (Emhan et al., 2012; Richards et al., 2013).

Among the studies that focused on the prevalence of mental health issues, all were quantitative, utilizing self-report questionnaire measures, with acceptable or above Cronbach's αs, and had a control or reference group. Two articles solely compared their findings against the national average (Lander et al., 2016; Leibler et al., 2017). Lipscomb and colleagues (2007) compared SHWs to individuals from the same community. The other articles (n = 4, 29%) used two control groups: one whose participants were theoretically matched to SHWs and one nonmatched (typically individuals from the same community). The matched control groups depended on the theory of the researcher. One article (Baran et al., 2016) came from a dirty work perspective and matched SHWs with jobs rated similarly on levels of prestige and "dirtiness" (janitors and homecare workers) by experts in dirty work theory and then compared them with 44 other professions. Hutz and colleagues (2013) compared SHWs to university staff as matched for stressful environments and then used university students as a control against both groups. Two articles compared SHWs with jobs relating to animals: butchers (Emhan et al., 2012) and farmers (Richards et al., 2013). The majority (n = 4) used a form of regression to analyze their data. The rest used one of the following methods: t test, analysis of variance, and mixed-model design.

The next key theme generated from the studies focused on how SHWs coped with the demands of their work (n = 4). However, the studies had variations on how they defined what SHWs were coping against. Kristensen (1991) focused on the risk of physical injury. Thompson (1983) focused on how SHWs cope with the monotonous but physically demanding and dangerous nature of such work. McLoughlin (2018) and Victor and Barnard (2016) focused on how workers coped with the psychological toll of slaughtering animals. One study (Kristensen, 1991) used self-report questionnaires. The others utilized a qualitative design: that is, Thompson (1983) used participant observation, Victor and Barnard (2016) used unstructured interviews, and McLoughlin (2018) used a combination of the two. Both interview studies were conducted from a phenomenological perspective, with McLoughlin (2018) utilizing the participant observation to give an emic perspective.

The final theme from the research examined the relationship between slaughterhouse employment and associated crime in the community (n = 2). Both articles had the same hypothesis: slaughterhouse employment was associated with an increase in crime. Rather than examining SHWs themselves, both articles examined the link between the presence of a slaughterhouse and associated crime in a US non-Metropolitan county. The studies had two different independent variables: the number of employees (Fitzgerald et al., 2009) and the number of slaughterhouse establishments (Jacques, 2015). Fitzgerald and colleagues (2009) operationalized crime as total arrests and reported crimes, and

Jacques (2015) only utilized total arrests. They looked for the same types of crimes: total, family, assault, violent crimes, murder, rape, and other sexual offenses. They both controlled for variables that are typically associated with crime such as demographics and unemployment rate. Additionally, Fitzgerald and colleagues (2009) further controlled for the poverty rate and migration, and Jacques (2015) controlled for female-headed households and population density. Both justified their control variables from the literature, stemming from social disorganization and crime theory. Furthermore, Fitzgerald and colleagues (2009) ran further analyses to investigate whether similar jobs (characterized by high levels of immigrant workers, low pay, routinized labor, and dangerous conditions) differed from slaughterhouse employment on their associated crime rates. Both reports used a negative binomial regression analysis, and Fitzgerald and colleagues (2009) also used an Ordinary Least Squares (OLS) regression for total arrests and total reports of crime.

Key Findings

As mentioned previously, the 14 studies included in this systematic review examined the psychological effects of slaughterhouse employment. The key findings of these studies will be presented in three sections: the prevalence of mental health issues, coping mechanisms, and the link with crime perpetration.

Prevalence of mental health issues

All of the studies concluded that SHWs have lower levels of psychological well-being compared with their respective control groups. The qualitative work conducted by Victor and Barnard (2016) found that South African SHWs reported suffering from the following psychological issues at the beginning of their employment as a consequence of their first kill: trauma, intense shock, paranoia, fear, anxiety, guilt, and shame. These findings were supported by studies employing quantitative methods. Kristensen (1991) found that half of their sample had high levels of stress-related symptoms. Furthermore, Baran and colleagues (2016) concluded that SHWs have significantly lower levels of psychological well-being compared with other professions (44 types), as they have lower levels of self-esteem, purpose, and personal development. The effect size was small but significant. The authors also conducted separate analyses where they identified similarly rated “dirty work” professions (professions that received virtually the same expert ratings on prestige and dirtiness; i.e., janitors and home care workers) and compared them to the other professions to see if there were differences in their psychological well-being. They found that these nonslaughterhouse dirty work professions did not differ from the other

professions on negative outcomes. This suggests that such psychological consequences may be a distinct outcome of working in a slaughterhouse.

For depression, significant differences were found in all comparative studies (i.e., SHWs indicated higher levels of depression than the comparison group; Hutz et al., 2013; Lander et al., 2016; Lipscomb et al., 2007), with the exception of Emhan and colleagues (2012). They found that SHWs had significantly higher levels of depression compared with office workers, but not butchers. The difference in depression rates differed from study to study, ranging from 10% to 50%. Lander and colleagues (2016) found that the prevalence of depression was four times higher than the national average. Lipscomb and colleagues (2007) found that rates of severe depression were more than five times higher than their reference group, controlling for gender and socioeconomic variables.

Similar findings were reported for anxiety, with SHWs having a higher prevalence compared with other professions (Emhan et al., 2012; Hutz et al., 2013) and the general public (Leibler et al., 2017). One study examined the relationship between ethnicity and anxiety, finding that non-Hispanic Whites were six times more likely to experience serious psychological distress. However, they attributed the finding to anxiety caused by their minority ethnicity status within the workplace (Leibler et al., 2017). Emhan and colleagues (2012) found that SHWs also had significantly higher levels of psychoticism, somatization, anger, and hostility compared with butchers and office workers. Similarly, Richards and colleagues (2013) found that SHWs had a higher propensity for aggression compared with the public and farmers, on all aspects of aggression (physical aggression, anger, and hostility) except verbal aggression, which was approaching significance. Interestingly, the women in their sample had a significantly higher propensity for aggression scores than the men.

Staff with the job role involving the slaughtering process itself were found to exhibit higher rates of mental health problems. Hutz and colleagues (2013) found that workers in the cutting sector had significantly higher prevalence rates of depression and anxiety compared with other roles in the slaughterhouse. Similarly, Richards and colleagues (2013) found that a propensity for aggression was also related to job roles, with the highest scores of aggression being associated with working in the “load outs” (i.e., handling the carcasses), followed by working on the kill floor, then the other roles. However, it is worth noting that the small sample size could have impacted on findings.

Coping mechanisms

Each study identified different types of coping mechanisms. Kristensen (1991) originally theorized that workers take days off to cope with the demands of the job. He argued that "sick days" were the result of workers being incapable of coping with the lack of breaks and therefore needed extended lengths of time to recuperate. When examining his data, he found that half of the participants had elevated levels of stress, however, the primary reason for taking time off work was to cope with physical injuries rather than psychological strain. In related work, Thompson (1983) found that SHWs struggled with the fear of physical harm. This fear was amplified by the monotony of their work. Workers often daydreamed to escape boredom, which resulted in an increase in injuries. There were also issues of victim blaming. The workers would attribute blame to the colleague who got injured rather than justify the accident as a result of workplace conditions. Furthermore, Thompson (1983) argued that the most psychologically impactful aspect of the work was the dehumanization, whereby workers described their role as part of a machine and thus easily replaceable. This was amplified by the social environment, as the workers were unable to interact with each other due to the excessive noise of the machinery and their fixed position on the production line. A consequence of the monotonous, machine-like environment was the workers' use of sabotage as a coping mechanism. That is, causing disruption was a symbolic method of expression of individuality and self-worth (Thompson, 1983).

Two studies examined how workers coped with the specific act of slaughtering of animals. McLoughlin (2018) posited that SHWs needed to conform to hegemonic masculinity in order to successfully complete their work. The reasoning underpinning this conformity was that emotions impeded their work, caused internal conflict, and lowered their status in the eyes of their peers. Thus, McLoughlin argued that workers deny, diminish, or repress their emotions as a form of a self-regulating coping mechanism. Victor and Barnard (2016) conceptualized the process of coping with slaughterhouse work into four stages. First, workers experience the identity shift of becoming a slaughterer, which is characterized by the mental trauma of their first kill and the, sometimes recurring, nightmares. Second, they (mal)adjust to their work, with some workers reporting heightened affective responses (e.g., guilt and shame) and personality changes (e.g., becoming more aggressive). Third, they begin to display (mal)adaptive coping mechanisms to enable them to continue working. Some participants found helpful ways to cope, such as relying on support from their family, community, or religion. However, others employed maladaptive coping mechanisms, including emotional detachment (akin to what McLoughlin [2018] theorized), self-medicating with drugs and alcohol, or resorting to violence. Workers also described the psychosocial consequences of the "job-home spillover," such as social detachment due to exhaustion, or even the perpetration of violence, typically in a domestic context.

Crime link

Two articles quantitatively examined the work spillover effect described in Victor and Barnard's (2016) study. Fitzgerald and colleagues (2009) examined crime reports from 1994 to 2002, whereas Jacques (2015) used data from 2000. Both articles found that slaughterhouse employment was associated with a significant increase in total arrests and arrests for sexual offending (i.e., rape) across all time periods, controlling for demographic and socioeconomic factors. Interestingly, Fitzgerald and colleagues (2009) found a significant negative effect on the number of rapes being reported. Contrary to their hypothesis, they both found no significant relationship between slaughterhouse employment and violent crime (i.e., aggravated assault and murder) during the same time period (from 1997 onward). However, Fitzgerald and colleagues found a significant positive relationship between 1994 and 1997. The studies had conflicting results for sexual offenses (not including rape) and crimes against the family.

Discussion

The purpose of this systematic review was to consolidate and synthesize the empirical research that examines the psychological impact of slaughterhouse employment. In summary, 14 studies met the inclusion criteria for this systematic review. Upon examination, the studies were delineated by study focus. Eight studies examined the self-reported prevalence of mental health issues in SHWs, four studies focused on the types of coping mechanisms used by SHWs, and two studies examined the link between slaughterhouse employment and crime.

There is evidence that slaughterhouse employment is associated with lower levels of psychological well-being. SHWs have described suffering from trauma, intense shock, paranoia, anxiety, guilt and shame (Victor & Barnard, 2016), and stress (Kristensen, 1991). There was evidence of higher rates of depression (Emhan et al., 2012; Horton & Lipscomb, 2011; Hutz et al., 2013; Lander et al., 2016; Lipscomb et al., 2007), anxiety (Emhan et al., 2012; Hutz et al., 2013; Leibler et al., 2017), psychosis (Emhan et al., 2012), and feelings of lower self-worth at work (Baran et al., 2016). Of particular note was that the symptomatology appeared to vary by job role. Employees working directly with the animals (e.g., on the kill floor or handling the carcasses) were those who showed the highest prevalence rates of aggression, anxiety, and depression (Hutz et al., 2013; Richards et al., 2013).

Given the psychological and psychopathological demands of slaughterhouse employment, the workers engage in a range of coping strategies. Some of the strategies are helpful and adaptive, such as taking days off work (Kristensen, 1991), and relying on prosocial forms of support (e.g., family or religion; Thompson, 1983). However, oftentimes, the workers employ strategies that are maladaptive, such as repressing difficult emotions (McLoughlin, 2018; Victor & Barnard, 2016), sabotaging their working environment as a form of expression (Thompson, 1983), using illicit substances, and/or engaging in interpersonal violence (Victor & Barnard, 2016). Therefore, it is unsurprising that crime statistics indicate a positive association between the presence of slaughterhouse establishments and crime arrests generally and rape arrests specifically (Fitzgerald et al., 2009; Jacques, 2015).

Limitations

The research reviewed was not without its limitations, and these limitations constrained the bearing of some of the conclusions. In particular, there were variations in the rigor of the research designs. For example, the use of control groups to evidence differences in mental health symptoms and diagnoses was useful to contextualize the vulnerability of SHWs. However, some comparisons were more informative than others. It is only possible to conclude that there was something unique about slaughterhouse employment that was driving the prevalence of mental health issues if the groups only differ on one factor. If multiple differences were found, then conclusions cannot be confidently drawn as to which of the factors may be driving the effects (i.e., varying prevalence rates). Hence, these conclusions must be considered with caution. For example, two articles (Lander et al., 2016; Leibler et al., 2017) compared mental health prevalence rates against the national average. Although this provided a normative baseline, this may be a questionable comparison to make since there is such a large within-group variation of depression rates across the United States, and thus a large number of confounding variables. Lipscomb and colleagues (2007) made a more informative comparison by recruiting a control group from the same community but had not worked in the slaughterhouse for at least 5 years and were matched by age, gender, and controlled for socioeconomic variables, thus reducing the number of confounding variables. They found that simply working in the slaughterhouse, compared with a similar individual (in relation to their demographics) from the same town, is still likely to result in a higher prevalence rate of depression.

Other studies used two comparison groups in order to further reduce confounds: a theoretically matched control and then a dissimilar group to compare against. These study designs, although more rigorous, do come with their own issues regarding the matched controls. The researchers argued that their theoretical controls enabled them to examine

whether an aspect of slaughterhouse work (typically the slaughtering of animals) was markedly different from jobs that are similar on other variables. For example, two studies matched SHWs with other jobs which involved handling farmed animals (i.e., butchers [Emhan et al., 2012] and farmers [Richards et al., 2013]). Although these comparisons may make intuitive sense, since all of those professions are involved in the meat production process, they are markedly different from SHWs. Farmers work with live animals and raise/nurture them for slaughter, and butchers process the "stock" (i.e., the already slaughtered animals) and provide a service akin to retail work. Richard and colleagues' (2013) research was able to identify that SHWs differ significantly on levels of aggression and hostility but was unable to infer which part of slaughterhouse employment causes these effects. Two studies attempted to isolate factors within slaughterhouse employment which they believed were causing the effects. Hutz and colleagues (2013) hypothesized that it was the stressful environment that decreased the workers' psychological well-being, but that there was something unique to slaughterhouse employment over and above stressful conditions. Therefore, they used a control group of university staff, who they argued had equally stressful jobs. However, they did not provide any evidence for how they matched the two professions on stress levels. Baran and colleagues' (2016) research stemmed from dirty work theory and thus matched SHWs with similarly "dirty" jobs. Unlike Hutz and colleagues (2013), they used independent experts in the field to rate 44 occupations on two key areas of dirty work (prestige and dirtiness), and then selected two professions that had similar mean scores to the ratings of SHWs. Thus, this matched comparison was achieved more rigorously and it was grounded in theory.

Importantly, these studies have highlighted associations between slaughterhouse employment and detrimental effects on mental health and behavior (i.e., criminal behavior), however, the research designs do not allow us to infer causality. There is a tendency to assume that slaughterhouse employment *causes* these poor outcomes. The data, so far, can neither confirm nor dispute this assumption. Theoretically speaking, there is room for counterarguments, one of which is the process of self-selection. That is, individuals with mental health difficulties and/or antisocial proclivities could choose this form of employment for a variety of reasons. Slaughterhouse employment is typically low-skilled, low-pay work. People who already have a criminal record will likely have limited employment opportunities available to them. Slaughterhouse establishments are also more likely to be located in low-income areas where mental health issues are more prevalent, resulting in this form of employment being one of the limited options available. Ultimately, there is insufficient evidence to substantiate whether slaughterhouse

employment causes detrimental effects, or whether people with existing vulnerabilities are attracted to this form of employment.

What is abundantly clear from this review is that more research is needed. The limited number of studies is indicative of a wider issue. There are challenges to gaining access to recruit participants for a number of reasons. Some employers might be concerned that research would lead to significant policy (and financial) changes if workplace conditions are indeed found to cause psychological and physical harm. Other employers might be concerned that the research is underpinned by animal welfare motivations to cease their business practices. Essentially, their skepticism results in an unwillingness to allow access to researchers. Nonetheless, people who work in slaughterhouses appear to be particularly vulnerable regardless of whether this form of employment is the cause or another symptom, and we have a duty of care to conduct further research.

Future Directions

Future research must first begin with “buy-in” from business allies (i.e., slaughterhouse employers) to work collaboratively in setting and carrying out a research agenda. Slaughterhouse employment is linked to psychosocial sequelae that impact surrounding communities. Current conditions are not sustainable, given the evidence for high turnover (i.e., Fitzgerald, 2010) and mental health needs of employees as discussed in this review. Therefore, a collaborative approach to this research can result in a better understanding of the problem and an evidence base to inform effective solutions.

With growing opportunities for research must come an improved, rigorous approach to the study designs. One of the research questions that need to be urgently addressed is whether slaughtering animals causes mental health issues and criminal behavior. The only way to answer this question is to conduct a longitudinal study that can demonstrate, over time, whether people who work in slaughterhouses have declining mental health and an increase in antisocial behavior. This research must also involve a matched control group of similar age, ethnicity, socioeconomic background, and location/neighborhood. Only then can we evidence cause and effect so that the appropriate interventions can be developed to target appropriately.

Finally, as the number and quality of studies grow, there will be an opportunity to conduct a meta-analysis across studies. This will enable us to establish within- and between-study similarities and differences that can inform larger scale policy developments to reduce physical and psychological harm to slaughterhouse employees.

Conclusions

The findings of this review illustrate the scarcity of research on the psychological well-being of SHWs. The existing research evidences the relationship between this form of employment and negative psychological and behavioral outcomes, both at the individual level and for the broader society. Also, these findings have clear implications for mental health and community professionals who are in a position to address the negative consequences of this industry. However, much more theoretical and empirical work is needed to develop the evidence base for developing prevention and intervention strategies.

Implications for Research, Policy, and Practice

Research

- Research is needed to explicate the underlying mechanisms and processes linking slaughterhouse employment and both psychological (i.e., mental health) and behavioral (i.e., antisocial behavior) outcomes.
- There is a critical need for research examining the psychological characteristics of individuals who seek employment in slaughterhouses and the longer-term effects of animal killing.

Policy

- Slaughterhouse employers should review the range of possible explanatory factors in this review for employee burnout, turnover, and other performance issues.
- Implementation of clinical supervision requirements for slaughterhouse employees would help in the early identification of psychological well-being issues. This would also protect against employee burnout, turnover, and associated performance issues.
- Independent inspections of slaughterhouse facilities should also include a review of employee support provision.

Practice

- This review offers an overview of potential treatment needs for practitioners (e.g., Criminal Justice System professionals, psychologists, occupational health practitioners).

- Protocols for clinical supervision in mental health settings will have transferrable content as a baseline. Further development and evaluation of protocols that are accessible to slaughterhouse establishments could lead to a reduction in the psychological and behavioral outcomes outlined in this review.

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Dear Madam Mayor, Supervisors, and Commissioners:

I am writing in response to Item 13.3 LU-2021-0308 on the Agenda for the Planning Commission meeting on 9/29/21. As Planning Committee Commissioners are appointed by the Board of Supervisors and/or a particular Supervisor, I believe it is important that you are all made aware of critical information relevant to this agenda item – information that supports the conclusion that locating a slaughterhouse within our City (County) limits will have major negative impacts on County revenues, tourism, and quality of life for our citizens.

As a resident located on August Dr., two houses down from the "cutoff" required for the Official Notice of Public Hearing, I am horrified and scared by the prospect of having a slaughterhouse within a quarter mile of my home and in direct line of sight from my daughter's school bus stop. As a recently divorced, formerly stay-at-home mother, who teaches part time at Western Nevada College, my only asset is my home. My quality of life, as well as my daughter's, and my elderly father's (he lives with me), is directly in the 'line of fire' of the proposed slaughterhouse. This is an intensely personal matter – but also one with much broader implications not only for my neighborhood, but for our community.

As a trained researcher, I did what I do best – I researched. I found that slaughterhouses and their impact on communities is a well-documented topic. All the studies I found, whether they were peer-reviewed, academic research or community-based surveys, determined that having a slaughterhouse in one's community leads only to negative outcomes for individual citizens, neighborhoods, and the community overall. I have attached several of these studies to this email.

My conclusion was that the proposed slaughterhouse will significantly harm our community by decreasing revenue, stunting growth and tourism, increasing crime, introducing significant air and water pollution, and harming the health and well-being of our citizens.

The proposed slaughterhouse <u>WILL</u> significantly negatively affect the use, peaceful enjoyment, economic value, and development of surrounding properties and the general neighborhood; and it <u>WILL</u> cause objectionable noise, vibrations, fumes, odors, dust, glare and physical activity.

Because of the evidence-supported reasons listed below, I strongly urge you to DENY this request for a special use permit.

#1: The Community Does NOT Support This Project!

Carson Valley Meats may have "customer" support, but despite the statements made in their press release, they do not have "community support" for this project. In fact, Carson Valley Meats failed to do due diligence with the hundreds of citizens living in residential neighborhoods near the proposed location – the only contact we had was the required Official Notice of Public Hearing.

Further, Carson Valley Meats is in Gardnerville. They already tried to build their slaughterhouse there and failed because the community did not support it.

Disregarding this strong and clear community voice, Carson Valley Meats then chose to sue Douglas County. They lost. And now they are here in our community.

My research found that the main interaction between slaughterhouses and their owners and the "community" is when the slaughterhouses are the subject of successful litigation by residents who are harmed by these facilities.

#2: This is NOT About "Demand" – It's About LOCATION

Whether there is or isn't demand for a slaughterhouse is tangential to the issue at hand – which is a request for a SPECIAL use permit regarding the location of the facility. This request is required because common sense tells us that slaughterhouses do not belong within City limits, but rather in non-residential areas.

First, when this same type of permit is denied in Douglas County – a county with a great deal more ranches and animals and thus higher demand for a slaughterhouse – the point about this being about LOCATION is clear.

Second, contrary to the claim by the Carson Valley Meats application, residential neighborhoods and a variety of citizen activities will be affected by the proposed slaughterhouse. The proposed location is only 900 feet from a neighborhood -- that is less than a quarter mile! Additionally, the harmful outcomes from slaughterhouses are felt by people and properties as far out as 3 miles from the facility. The proposed slaughterhouse is within a 2-mile radius of hundreds of residences, dozens of businesses, two golf courses, an elementary school, and the animal shelter.

Third, the location of this slaughterhouse sits at the ONLY **Eastern Gateway** into our City, along a historic, heavily used highway frequented by locals and tourists – who will, if you approve this special use permit, be greeted by a strong stench of feces, dust filled with fecal particles, and the loud noises of the stressed vocalizations of animals awaiting slaughter.

Is this the message we want to send to folks coming into town from Fallon or Dayton or farther for a Wine Walk or classic car show? Is this the experience we look forward to when we take our children, snuggled in their pajamas, to meet Santa and ride on the Polar Express?

Finally, in today's world, **most** communities are strongly opposed to having a slaughterhouse in their neighborhoods. In fact, this past June, one community in Connecticut filed a lawsuit against their Zoning Board of Appeals because the Board approved such a facility.

The people of Carson City and across the U.S. are in agreement -- slaughterhouses belong in non-residential areas, far away from the places citizens live and recreate.

#3: Property Values Will Decrease by 26% (at minimum!)

There is a great deal of evidence showing that slaughterhouse depress real estate values and transactions. Usually, this research is done within 3 MILES of a facility. The location of the proposed slaughterhouse is only 900 FEET from a residential neighborhood – that is about two tenths of a mile!

Residences near slaughterhouses (within 3 miles) can expect their property values to decrease by 26%, and properties abutting the slaughterhouse will see their property values decline by as much as 88%.

A 26% decrease in the value of my home would be a financial disaster, as it would be for many of my neighbors. 26% is an impactful number – Would you like your investments to go down by 26%? How about your paycheck? Your lifespan?

The presence of a slaughterhouse is, in real estate parlance, a "negative externality", which is generally considered NOT "economically curable" – that means we're stuck with it and the stigma of trying to sell a home next to a slaughterhouse.

Research on communities across the country shows a decrease in property tax values ranging from **18% to 40%.** Residents often litigate this matter – and win.

#4: Economic Vitality Will Decrease

Regardless of whether you eat meat or not, the fact is that NO ONE wants a slaughterhouse in their backyard. Citizens and tourists are sure to alter their plans to avoid the odor, noise, and air pollution produced by the slaughterhouse. Citizens will divert to Arrowhead Road and Deer Run Road to avoid this patch of Hwy 50 (including the drainage from the proposed plant that runs off towards the highway).

The businesses along this part of Hwy 50 will lose customers and the neighborhoods along Arrowhead and Deer Run will see increased "thru traffic" – putting a burden on streets meant for local use only.

Additionally, it's likely that tourists will choose alternate routes when possible and perhaps decide not to visit Dayton and Fallon. Thus, the proposed slaughterhouse will have a negative impact on our neighboring communities as well.

#5: Arrests for Rape, Sexual Assault, & Family Violence Will Increase

As a mother of a 15-year-old daughter, I was stunned to find sound, peer-reviewed research demonstrating that slaughterhouse employment, especially at smaller custom facilities, is directly related to increased rates of arrests for rape, sex offenses, domestic violence, and other family-related crimes (violent and non-violent) (Fitzgerald et al., 2009). I've attached these studies for your review.

The fact is that there is a great deal of research on the harmful effects of slaughterhouse work on its employees. (There is also a great deal of individual and class-action litigation regarding these effects – workers, their unions, and others have sued on the behalf of these workers.)

A 2021 study found that slaughterhouse workers "*have a higher prevalence rate of mental health issues, in particular depression and anxiety, in addition to violence-supportive attitudes…the research reviewed has shown a link between slaughterhouse work and antisocial behavior generally and sexual offending specifically."*

Yes. The evidence shows that putting a slaughterhouse in our City will increase rapes, sexual assaults, and violence within families. In a community of our size, even the small number of employees proposed by Carson Valley Meats will have a significant impact. And is yet another reason for locals and tourists to avoid the businesses adjacent to the facility.

#6: Carson City Residents Will Get Sick and Stay Sick

Human health will be severely negatively impacted by the proposed slaughterhouse. Our physical and emotional health will suffer due to air and water contamination from the manure of 60 to 120 animals. Additionally, slaughterhouses attract flies and other insects, often "carrying resistant strains of **pathogens**" and parasites.

There has been a lot of research on people who live near slaughterhouses and other animal facilities. Research shows that folks living within TWO MILES of this type of facility have suffered "*headache, runny nose, sore throat, excessive coughing, diarrhea, burning eyes…increases in eye and upper respiratory infections…and acute and chronic respiratory disease…".*

Studies on the "spatial hedonics" of these sorts of facilities have found that within THREE miles there is an 18% negative impact on health, within ONE mile – the negative health impact is 23.5%.

These are real and documented health situations that are known mainly because of litigation – where residents successfully sued meat processing companies and their owners.

#7: Our AIR Will Be Polluted 24/7 – ODOR & DUST

The proposed facility will produce a strong odor due to the ammonia, hydrogen sulfide, and methane produced by the animals. The air will be filled with particulate matter from manure (aka "fertilizer").

The proposed design makes **NO** mention of any air filtration systems

The assertion by Carson Valley Meats that there will be no objectionable odor, noise, and dust because there are "only" 60 animals is misleading.

First, 60 animals produce a lot of waste. Research shows that "one hog excretes nearly three gallons of waste per day or 2.5 times the average human's daily total." (Hopey, 2003). One gallon of animal waste weighs about 8.5 lbs (Livestock and Poultry Environmental Learning Community Administration, 2019). Let's do the math: 1 gallon of waste = 8.5 lbs, 3 gallons of waste/day for ONE hog = 25.5 lbs a day; 60 sows = 25.5lbs x 60 = 1,530 lbs = .765 tons – **almost 1 TON of manure in ONE DAY!**

How quickly the manure is cleaned up is **NOT** a safeguard for public health. EVERY day that manure is present will cause a stench and spew fecal matter into the air.

Further, research shows that slaughterhouses and other animal operations often violate the standards and regulations they are supposed to follow (hence the high litigation

rate). The Staff Report makes **NO** mention of any oversight or regulatory enforcement activities by the City.

#8: Our WATER Will Be Polluted 24/7

Groundwater and surface water contamination will result from the blood and fecal matter produced by the proposed slaughterhouse.

The Center for Biological Diversity (2019) reports that in 2019 *"twelve conservation and community groups representing millions of people sued the U.S. Environmental Protection Agency…for its decision not to update national standards restricting water pollution from slaughterhouses."* Thus, Staff's reliance on federal agencies to protect us **NOT** sufficient.

The proposed slaughterhouse is located adjacent to the Carson River and will be using City utilities such as sewer and water. The Center for Biological Diversity (2019) reports that "*Meat-processing plants discharge water contaminated with blood, oil, grease and fats. This wastewater contains nitrogen and phosphorus pollution, pathogens and other contaminants. When released into waterways, pollution from slaughterhouses can cause algae blooms that suffocate aquatic life and turn waterways into bacteria-laden public health hazards."*

The Water System Report submitted by Carson Valley Meats does **NOT** address these water-related issues. It merely states that water will flow in and out of the proposed design meets standards. The problem is not the flow – it's what's in the flow. The report from Manhard Consulting focuses on drainage from the detention ponds during storm events. There is **NO** information in the special use permit application that speaks directly to the pollutants that will be in the water and how they will be filtered out. Utilizing the City sewer system means that these pollutants will be made available to our entire community.

#9: There Will Be Objectionable Noise – Sounds "Like Killing Babies"

Noise is a significant factor that affects real estate transactions and property values. It is well-known that slaughterhouses are noisy in terms of high decibel levels. Much research has been done on this, finding noise up to 95.2 decibels – in the "Very Loud Range" (dangerous for over 30 minutes) (Iulietto et al., 2018).

Slaughterhouses are also notorious in the quality of the noise – often described as "screaming", popularized by the movie, "Silence of the Lambs". One resident who lives near a slaughterhouse in Pennsylvania said, "It sounds like they're killing babies."

(White, 2000). The residents of that PA neighborhood were forced to litigate the matter – they won.

Although harvesting for the proposed slaughterhouse will be done inside a building, the Carson Valley Meats application makes **NO** mention of *any* noise mitigation measures other than the building itself. The vague design description mentions NO soundproofing or other measures for the harvesting areas nor for the holding areas.

IN CONCLUSION: Please Deny the Request for a Special Use Permit!

The evidence is clear. The harmful effects from slaughterhouses are well-documented and well-litigated. The proposed slaughterhouse may well benefit a few of our citizens – and it most certainly will have a significant **negative** effect on **ALL** of our citizens.

Carson City will experience a major decrease in revenue and quality of life by granting this special use permit. As Carson Valley Meats turns a profit, our citizens will suffer significant decreases in quality of life and physical and mental health, and our community will lose major tax, growth, and tourism revenues.

I urge you to deny this request: Don't slaughter our neighborhood! Don't slaughter our community!

Sincerely,

Jennifer M. Verive, Ph.D.

Animal Operations and Residential Property Values

by John A. Kilpatrick, PhD, MAI

ABSTRACT

Animal feeding and processing operations have grown more concentrated, with each facility handling much larger numbers of animals than traditional farms. The larger concentration of animals impacts the quality of surrounding air and water. In addition, the facilities impact the economic conditions of the communities where they are located. All of these factors can potentially affect the value of nearby houses. This article summarizes the current literature on how animal operations may affect the value of residential properties located near such facilities; this information will be useful to practicing appraisers faced with valuing houses in these communities.

Animal operations (AOs) may be broadly defined as facilities in which animals are raised or brought for slaughter. The common denominator is a large perpetual inventory and density of animals.[1]

Although livestock and poultry production has more than doubled in the United States since the 1950s, the number of animal operations has decreased by 80%.[2] Food animal production in the United States has shifted to concentrated facilities where animals usually are raised in confinement. This concentration of animals brings environmental concerns related to air and water quality as well as animal and human health. As a result, animal operations are subject to regulation by the US Environmental Protection Agency (EPA), the US Department of Agriculture (USDA), and a variety of state entities. Laws and government regulations related to animal operations include specific definitions based on the function and size of the operations. For example, the EPA defines *animal feeding operations* (AFOs) as

> agricultural enterprises where animals are kept and raised in confined situations. AFOs congregate animals, feed, manure and urine, dead animals, and production operations on a small land area. Feed is brought to the animals rather than the animals grazing or otherwise seeking feed in pastures, fields, or on rangeland.[3]

To qualify as an AFO, an animal operation must confine animals for at least 45 days in a twelve-month period.[4] According to the EPA, there are approximately 450,000 AFOs in the United States.[5] The EPA also designates certain AFOs as *concentrated animal feeding operations* (CAFOs) based on the confinement of large numbers of animals and the pollutant discharge. At CAFOs, there is a higher concentration of waste that increases the potential impact on air, water, and land quality.[6] CAFOs are regulated by the EPA under the Clean Water Act,

1. Quite a few documents were reviewed to develop this discussion; see subsequent footnotes and Drew L. Kershen and Chuck Barlow, "Concentrated Animal Feeding Operations and Water, Air, Land, and Welfare," report on the American Bar Association (ABA) Special Committee on Agricultural Management Roundtable II on Environmental Challenges in Animal Feeding Operations (September 23, 1999).
2. EPA, *Literature Review of Contaminants in Livestock and Poultry Manure and Implications for Water Quality* (EPA 820-R-13-002, July 2013), 3; http://water.epa.gov/scitech/cec/upload/Literature-Review-of-Contaminants-in-Livestock-and-Poultry-Manure-and-Implications-for-Water-Quality.pdf.
3. EPA, "What is a CAFO?", http://www.epa.gov/region07/water/cafo/.
4. Ibid.
5. EPA, "Animal Operations," http://www.epa.gov/agriculture/anafoidx.html.
6. http://www.epa.gov/region07/water/cafo/cafo_impact_environment.htm.

as environmental concerns arise when waste runoff is discharged onto adjacent landscapes and waterways.[7]

As the structure of the livestock industry has trended toward concentration of more animals in fewer operations, state and local governments also have acknowledged the problems associated with large operations by enacting legislation imposing stricter regulations on CAFOs and increasing separation distances.[8] For example, in North Carolina the following mandatory setbacks are imposed on new or expanded farms with 250 or more hogs: 1,500 feet from occupied residences, 500 feet from any residential property boundary to swine houses and lagoons, and 75 feet from any residential property boundary to sprayfield boundaries.

Overall, the empirical evidence indicates that residences near AOs are significantly affected, and data seems to suggest a valuation impact of up to 26% for nearby properties, depending on distance, wind direction, and other factors. Further, there has been some suggestion that properties immediately abutting an AO can be diminished as much as 88%. One study estimates the total negative impact to property values in the United States at $26 billion.[9] Mitigation makes a marginal impact. Not only are residences affected, but nearby small farms can be impacted by such factors as water degradation and insects.

Environmental Impacts and Regulation of Animal Operations

AOs are generally recognized to affect the surrounding environment in several key ways: air quality and odors (ammonia, hydrogen sulfide, methane, and particulate matter), greenhouse gas and climate change, insect vectors (often carrying resistant strains of pathogens), groundwater and surface water contamination, and a variety of pathogens.[10]

Data from the USDA and the EPA estimate that livestock in the United States produce 130 times the total amount of manure as the entire human population of the country. For example, one hog excretes nearly three gallons of waste per day or 2.5 times the average human's daily total. A 3,000-sow AO will produce about 25 tons of manure a day.[11] A similar number of chickens will produce about 700 pounds of manure per day (plus or minus 30%), containing about 9 pounds of nitrogen gas, 7.5 pounds of phosphorus pentoxide (a powerful irritant and corrosive) and over 4 pounds of potassium oxide, a highly reactive deliquescent that reacts violently with water to produce potassium hydroxide.[12] Manure from livestock production can contain bacteria (salmonella, E. Coli 0157:H7), parasites, viruses, and antimicorbials (antibiotics and vaccines).[13] Excessive levels of phosphorus in land and water have been correlated with livestock density; and manure has caused eutrophication and degradation of US waterways.[14]

AOs are regarded as potential sources for contamination because of the large amounts of manure that they produce, and because the proximity in which the animals are confined allows for disease to be easily transferred.[15] A 2006 outbreak of E. coli 0157:H7 was associated with the consumption of fresh spinach that had been in contact with water contaminated with animal feces.[16] One of the

7. The USDA and EPA first regulated animal operations under the 1999 "Unified National Strategy for Animal Feeding Operations," see http://water.epa.gov/polwaste/npdes/afo/Animal-Feeding-Operations-Regulations.cfm. The USDA Economic Research Service presents a discussion of regulatory issues related to animal waste at http://www.ers.usda.gov/topics/animal-products/animal-production-marketing-issues/policy-regulatory-issues.aspx#regulatory. Up-to-date information on the Clean Water Act is available at http://www2.epa.gov/laws-regulations.
8. Joseph Herriges, Silvia Secchi, and Bruce A. Babcock, "Living with Hogs in Iowa: The Impact of Livestock Facilities on Rural Residential Property Values" (Iowa State University Center for Agricultural and Rural Development working paper, August 2003).
9. Doug Gurian-Sherman, *CAFOs Uncovered: The Untold Cost of Confined Animal Feeding Operations* (Cambridge, MA: Union of Concerned Scientists, 2008).
10. Carrie Hribar, *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities* (National Association of Local Boards of Health, 2010), available at http://www.cdc.gov/nceh/ehs/docs/understanding_cafos_nalboh.pdf.
11. Don Hopey, "Study Finds Large Hog Farms Lower Property Values," *Post-Gazette* (June 7, 2003).
12. Jing Tao and Karen Mancel, "Estimating Manure Production, Storage Size, and Land Application Area," Ohio State University, 2008 Agricultural Fact Sheet. According to a study by the University of Wisconsin-Madison, the average chicken farm has 14,500 birds, with farm sizes ranging up to 50,000 birds; see UW-Madison College of Agricultural and Life Sciences, Center for Integrated Agricultural Systems, Research Brief 63, January 2003.
13. EPA, *Literature Review of Contaminants in Livestock and Poultry Manure*.
14. Stephen Jann, "Recent Developments in Water Pollution Control Strategies and Regulations," presentation at ABA Special Committee on Agricultural Management Roundtable II on Environmental Challenges in Animal Feeding Operations, Minneapolis, MN (May 12, 1999).
15. "National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs); Final Rule" *Federal Resister* 68 (February 12, 2003). Note that portions of this were subsequently overturned in *Waterkeeper Alliance v. EPA*, 399 F.3d 486.
16. "FDA Finalizes Report on 2006 Spinach Outbreak," FDA (March 24, 2007), http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/2007/ucm108873.htm.

leading causes of food and waterborne illness in the United States is this E. coli 0157:H7 organism, which is a specific strain of the Escherichia coli bacteria commonly found in the intestines of healthy cattle. One means of transfer of E. coli to humans occurs when untreated manure is able to enter water sources or used for fertilization.[17] The EPA acting under the Clean Water Act has designated AFOs as point sources of pollution and requires that they have zero discharge or apply for a permit that requires an extensive waste management plan. Despite regulatory efforts to segregate manure-related contaminants from the water supply, contaminants still may enter the supply because of flooding, leeching into the soil, or through disregard of regulations.

In addition to water quality issues related to manure and waste run-off, animal operations facilities attract flies and other insects and parasites.[18]

As noted in Kilpatrick, state entities began regulating AFOs in the late 1990s.[19] In 2000—2001, the EPA began levying fines against concentrated beef production facilities in the Northwestern United States that met two criteria: the facility confined animals for at least 45 non-consecutive days per year and the confinement area was devoid of vegetation. The rules generally applied to any operation with 300 head of cattle or more. At the time of the regulations, the EPA estimated that this would affect between 26,000 and 39,000 AFOs in the United States.[20]

On December 11, 2002, the EPA issued its final revised regulations.[21] The regulations affirmed the prior definitions of AFOs and CAFOs, provided for an explicit duty to apply for a permit, established required performance standards and best management practices, and explicitly required nutrient management plans.[22]

Overview of AO Impacts on Property Values

An AO can affect the value of proximate properties in two ways. First, AOs have a substantial indirect negative economic impact on surrounding communities, including property values in those communities, via shifts in sources of purchases and other inputs in the factors of production. An early study by Chism and Levins reports that smaller farms make nearly 95% of their expenditures locally, while larger operations spend less than 20% locally.[23] Gomez and Zhang study 1,106 rural communities and conclude that economic growth rates in communities with conventional farming are 55% higher than in those with AOs.[24] They document the negative impact of AOs on the economy of the surrounding community, as revealed by sales tax receipts and reduced local purchases. They note that conventional farmers buy most or all of their supplies locally, thus stimulating the local community and, by extension, stimulating the local real estate market. On the other hand, AOs bypass local retailers and import the factors of production. Gomez and Zhang state that AOs exacerbate the economic negative impact by "importing" large quantities of pollution and the attendant costs; they also find AOs cause "disruption of local social and economic systems, pollution problems resulting from intensive agriculture, and negative impacts on the quality of life in rural communities." This finding replicates those of an earlier study by Abeles-Allison and Connor, which showed AOs have the effect of crowding out more traditional farmers and decreasing purchases in local stores.[25]

Hence, local communities suffer the negative economic byproducts without the attendant economic benefits.

17. "Disease Listing, Escherichia Coli 0157:H7, Gen Info," Centers for Disease Control and Prevention, http://www.cdc.gov/ecoli/.
18. Stuart A. Smith, "Concentrated Animal Feeding Operations—Resources for Environmental Responsibility" (working paper prepared by Smith-Comeskey Ground Water Sciences, April 1, 2000); for additional information see http://www.groundwaterscience.com/resources/tech-article-library/100-concentrated-animal-feeding-facilitiesresources-for-environmental-responsibility-.html.
19. John A. Kilpatrick, "Concentrated Animal Feeding Operations and Proximate Property Values," *The Appraisal Journal* (July 2001): 301–306.
20. Peggy Steward, "Cattlemen Find CAFO Rules Confusing," *Capital Press Agricultural Weekly* (March 9, 2001): 9.
21. Claudia Copeland, "Animal Waste and Water Quality: EPA Regulation of Concentrated Animal Feeding Operations (CAFOs)," Congressional Research Service Report for Congress No 7-5700, February 16, 2010. The regulations were published in the *Federal Register* on February 12, 2003 and went into effect on April 14, 2003.
22. http://water.epa.gov/polwaste/npdes/afo/. Permitting is under the EPA's National Pollutant Discharge Elimination System (NPDES) program, which regulates the discharge of pollutants from point sources; CAFOs are defined as point sources by the Clean Water Act.
23. John W. Chism and Richard A. Levins, "Farm Spending and Local Selling: How Do They Match Up?" *Minnesota Agricultural Economist* 676 (1994): 1–4.
24. Miguel Gomez and Liying Zhang, "Impacts of Concentration in Hog Production on Economic Growth in Rural Illinois" (Illinois State U. working paper presented at annual meeting of American Agricultural Economics Association, July 30–August 2, 2000).
25. M. Abeles-Allison and L. Connor, *An Analysis of Local Benefits and Costs of Michigan Hog Operations Experiencing Environmental Conflicts* (Agricultural Economic Report 536, Department of Agricultural Economics, Michigan State University monograph, 1990).

Second, AOs impact values at the individual residential value level. Property values are impacted as market participants view the AO as a negative externality. As an externality, it is not typically considered economically curable under generally accepted appraisal theory and practice. Hence, the value diminution attributable to proximate location of an AO can be attributed to stigma. The next section discusses case studies regarding the effects of AOs.

Proximity Case Studies

Kilpatrick presented a series of case studies from the 1990s that document the impacts of AOs.[26] For example, a Minnesota homeowner lived near two swine AOs when her family reportedly became ill and testing found that the level of hydrogen sulfide was well above the danger levels.[27] An early study in North Carolina by Schiffman et al. reports emotional impacts (tension, depression, anger, reduced vigor, fatigue, and confusion) linked to airborne contamination emanating from an AO.[28] A later North Carolina study by Wing and Wolf reports increased incidences of headache, runny nose, sore throat, excessive coughing, diarrhea, burning eyes, and "reduced quality of life."[29] An early study in Iowa by Thu et al. finds increases in eye and upper-respiratory problems among those living within 2 miles of an AO.[30] A later Iowa study[31] finds extensive literature documenting acute and chronic respiratory disease and dysfunction among CAFO workers from exposures to complex mixtures of particulates, gases, and vapors; it concludes that CAFO air emissions may constitute a public health hazard.

Ables-Allison and Connor were among the first to examine property value impacts resulting from airborne contamination and odors.[32] Examining 288 sales between 1986 and 1989, they find that for every thousand animals added within a 5-mile area, there is an average sale price drop of $430 per property, with the most significant losses within 1.6 miles. Notably, they find that during the first half of 1989 an AO with greater than 500 animals was 50 times more likely to have an odor complaint lodged with the state than one with fewer than 500 animals.[33]

Taff, Tiffany, and Weisberg perform a hedonic price analysis on 292 rural residences in Minnesota and find a statistically significant pricing impact related both to the existence of an AO as well as the distance to the AO.[34] A 1996 study by Padgett and Johnson finds that homes within 0.5 mile of a CAFO decrease in value by 40%, and homes within 1.0 mile decrease in value by 30%, within 1.5 miles by 20%, and within 2.0 miles by 10%.[35] Palmquist, Roka, and Vukina quantitatively determine that AOs depress nearby home values. They develop a model to measure the spatial impacts of AOs and, like Padgett and Johnson, find differential value impacts at 0.5, 1.0, and 2.0 miles.[36]

Hamed, Johnson, and Miller, quantify both the average value impact of an AO as well as the impact by distance with a study of 99 rural, non-family real estate transactions of more than one acre near an AO. Thirty-nine of the properties in the study included a residence. An average residential parcel within 3 miles of an AO experienced a loss of about 6.6%. However, if that parcel was located within 0.10 mile of the AO (the minimum unit of measure in the study), then the loss in value was estimated at about 88.3%.[37]

26. Kilpatrick, "Concentrated Animal Feeding Operations."
27. Presentation at ABA Special Committee on Agricultural Management Roundtable II.
28. Susan S. Schiffman, Elizabeth A. Miller, Mark S. Suggs, and Brevick G. Graham, "The Effect of Environmental Odors Emanating from Commercial Swine Operations on the Mood of Nearby Residents," *Brain Research Bulletin* 37, no. 4 (1995): 369–375.
29. S. Wing and S. Wolf, "Intensive Livestock Operations, Health, and Quality of Life Among North Carolina Residents," *Environmental Health Perspectives* 108, no. 3 (March 2000): 233–238.
30. K. Thu, K. Donham, R. Ziegenhorn, S. Reynolds, P. Thorne, P. Subramanian, P. Whitten, and J. Stookesberry, "A Control Study of the Physical and Mental Health of Residents Living Near a Large-Scale Swine Operation," *Journal of Agricultural Safety and Health* 3, no. 1 (1997): 13–26.
31. *Iowa Concentrated Animal Feeding Operations Air Quality Study—Final Report*[End Ital], Iowa State University and the University of Iowa Study Group (February 2002), http://www.public-health.uiowa.edu/ehsrc/CAFOstudy/CAFO_final2-14.pdf.
32. Abeles-Allison and Connor, *Analysis of Local Benefits and Costs of Michigan Hog Operations*.
33. As previously discussed, this study also reports that AOs affect the economics of local communities.
34. Steven J. Taff, Douglas G. Tiffany, and Sanford Weisberg, "Measured Effects of Feedlots on Residential Property Values in Minnesota: A Report to the Legislature" (U. Minnesota Staff Paper Series, July 1996), http://ageconsearch.umn.edu/bitstream/14121/1/p96-12.pdf.
35. Reported in William J. Weida, "The CAFO: Implications for Rural Economies in the US" (Colorado College working paper, February 24, 2004), http://www.columbus.in.gov/planning/staff-reports/gelfius-materials-part-1/.
36. R. Palmquist, F. Roka, and T. Vukina, "Hog Operations, Environmental Impacts, and Residential Property Values," *Land Economics* 73, no. 1 (1997): 114–124.
37. Mubarek Hamed, Thomas Johnson, and Kathleen Miller, "The Impacts of Animal Feeding Operations on Rural Land Values," University of Missouri-Columbia, Community Policy Analysis Center Report R-99-02 (May 1999).

Additional empirical studies have supplemented these findings. Kim and Goldsmith analyze property values of 2,155 homes located within 3 miles of an AO in North Carolina. The principle focus of their study is spatial hedonics, and within a 3-mile area they find the average impact to be negative 18%. At 1 mile, they find the impact is negative 23.5%.[38]

Weida studies the economic and financial impact of CAFOs. While this study principally focuses on the diminished economic growth rates in communities surrounding CAFOs, it also notes the substantial decreases in property values in those areas, as evidenced by property tax reductions.[39]

Kuethe and Keeney find that the negative impacts of AOs are comparable to those generated by industrial waste, solid waste, and septic waste facilities.[40] They focus on airborne-related problems and note that odor is a particular source of nuisance, and higher-valued residences are more severely impacted.

The odor and airborne particulate issues also have been explored in a more recent study by Isakson and Ecker. They examine the impact of swine CAFOs on sale prices of 5,822 houses in Iowa. The study shows large adverse impacts for houses located within 3 miles and directly downwind from a CAFO—a loss of value of as much as 44.1%. Value loss diminished to 16.6% for houses not directly downwind, and loss in value decreased to 9.9% for houses directly downwind but 3 miles away. Isakson and Ecker also find a correlation between CAFO size and value loss; a 10% increase in CAFO size resulted in a 0.67 % decrease in house price as far as 7 miles from the nearest CAFO.[41]

Studies Using GIS

Increasingly, AO studies have relied on geographic information systems (GIS) technology and other spatial methods to investigate property value impacts.

Worley Rupert, and Risse use GIS to examine the efficacy of buffers to mitigate AO impacts.[42] They find that adding buffers to animal operations reduces the amount of land available within an area for such operations.

Cajka, Deerhake, and Yao present a study technique using GIS and modeling software to investigate the dispersion of air pollution emanating from CAFOs. The advantage of this approach is it looks at cumulative emissions from multiple sources.[43]

Milla, Thomas, and Ansine, study homes in Craven County, North Carolina, use a GIS-based hedonic pricing model to evaluate the impacts of CAFOs, particularly hog operations, on residential property values. Their results indicate a negative and significant impact on property value from hog operations and a relationship between distance to hog farms and property sale prices. They determine that a farm with 5,000 animals has a statistically significant impact on values of homes 1 mile away, with an impact on the average home of 3.1%.[44]

Based on the results of the case studies, it is quite apparent that significant externalities are associated with animal feeding operations, that the relationship between externalities, farm characteristics, and community attributes can be quite complex, and that negative impacts of animal facilities, as reflected in lowered property values, can extend beyond established setbacks. The GIS-based studies suggest the externalities associated with AOs are a function of distance and that the GIS-based hedonic price modeling is a promising method for assessing property value damages associated with animal operations, for evaluating potential impacts when siting new operations, and for developing setback guidelines.

38. Jungik Kim and Peter Goldsmith, "A Spatial Hedonic Approach to Assess the Impact of Swine Production on Residential Property Values," *Environmental and Resource Economics* 42, no. 4 (April 2009): 509–534.

39. William J. Weida, "Potential Regional Economic Effects of CAFOs" (Colorado College working paper, August 24, 2001), available at http://sraproject.org/wp-content/uploads/2007/12/commentsonthepotentialregionaleconeffectsoffeedlots.pdf.

40. Todd H. Kuethe and Roman Keeney, "Environmental Externalities and Residential Property Values: Externalized Costs Along the House Price Distribution," *Land Economics* 88, no. 2 (2002): 241–250, available at http://naldc.nal.usda.gov/naldc/download.xhtml?id=54130&content=PDF.

41. Hans R. Isakson and Mark D. Ecker, "An Analysis of the Impact of Swine CAFOs on the Value of Nearby Houses," *Agricultural Economics* 39, no. 3 (November 2008): 365–372.

42. J. W. Worley, C. Rupert, and L. M. Risse, "Use of GIS to Determine the Effect of Property Line and Water Buffers on Land Availability," *Applied Engineering in Agriculture* 17, no. 1 (September 2000): 49–54; available at https://www.itos.uga.edu/library/buffers.pdf.

43. Jamie Cajka, Marion Deerhake, and Chengwei Yao, "Modeling Ammonia Dispersion from Multiple CAFOs Using GIS," *Proceedings of the 24th ESRI Users Conference*, August 9–13, 2004, available at http://proceedings.esri.com/library/userconf/proc04/docs/pap1381.pdf.

44. Katherine Milla, Michael H. Thomas, and Winsbert Ansine, "Evaluating the Effect of Proximity to Hog Farms on Residential Property Values: A GIS-Based Hedonic Price Model Approach," *URISA Journal* 17, no. 1 (2005): 27–32.

Legal and Regulatory Actions

Legal and regulatory actions also can reveal the impacts of AOs on nearby properties. For example, in 2000, Central Industries operated a large-scale poultry rendering plant near Central, Mississippi. As part of the process, large quantities of poultry processing byproducts were brought to this facility for further processing. The plant had been subject to a number of flooding events, spreading bacteria-laced poultry byproducts into nearby creeks and downstream rivers. Poultry byproducts were discovered up to 50 miles away from the rendering plant. For violations of the Clean Water Act, company officers were fined varying amounts up to $300,000 each, and the company was fined $14 million.[45] Researchers found property value diminution of up to 60% for farms closest to the plant, and transaction prices impacted as far as 11 miles away.

In numerous counties across the country tax assessors have granted property value reductions as a result of proximity to AOs. For example, Beasley reports that Clark County, Illinois, established a property tax abatement for fifty homes around a swine AO. Homes within 0.5 mile were determined to have values diminished by 30%, ranging down to a 10% reduction in value for homes at 1.5 miles.[46]

Aiken reports that the Nebraska Court of Appeals ruled that county board of equalization erred in not considering a rural residence's proximity to a swine facility in determining the residence's valuation. The owner of the facility also built a house 0.75 mile away and obtained an easement to spray the hog manure on the cropland across the road from the house. The court ordered the county to ignore the fact that the swine were also the property of the owner. The court cited Nebraska livestock nuisance decisions that show that hog odors would influence the home's value. Upon the ruling, the county accepted a determination by a local, independent appraiser that the value was diminished 30%.[47]

Spears reports that in the summer of 2003, health officials declared about 40 kilometers of beaches on Lake Huron permanently unsafe because of E. coli bacteria emanating from nearby AOs. This became the first new pollution hot spot on Canada's side of the Great Lakes in almost twenty years. Lab tests demonstrated that the E. coli levels in the streams feeding Lake Huron, and draining off nearby AOs, exceeded water quality standards by as much as 41,000 percent.[48]

Ready and Abdalla expand upon the hedonic analyses of others and reviewed the amenity and disamenity impacts of agriculture in Berks County, Pennsylvania, including different types of open space (publicly owned, eased, vacant, pasture/crops), landfills, airports, mushroom production, and AOs. The study determines that "only landfills have a worse effect on adjacent property values,"[49] and further states, "a sewage treatment plant has less depressing effects on nearby housing prices

Table 1 Property Tax Reductions in Areas Around AOs

Area	Amount of Reduction	Property Type
Grundy Co, MO	30%	
Mecosta Co, MI initially:	35%	Dwellings only
later changed to:	20%	Land and structures
Midland Co, MI	20%	
DeWitt Co, IL	30%	
McLean Co, IL	35%	
DeKalb Co, AL	Base reassessment, variable rates	
Renville Co, MN	Base reassessment, variable rates	Dwellings only
Humbolt Co, IA	20%-40%	Dwellings only
Frederick Co, MD	10%	
Muhlenberg Co, KY	18%	Dwellings only

45. US Department of Justice Press Release, November 2, 2000.

46. Lee Beasley, "Cumberland Hog Facility May Affect Clark County Homeowners Property Values," *Guardian Publishing* (2001).

47. J. David Aiken, "Property Valuation May Be Reduced by Proximity of Livestock Operation" Cornhusker Economics, Department of Agricultural Economics, University of Nebraska–Lincoln (May 2002).

48. Tom Spears, "Ontario's West Coast Permanently Polluted," *The Ottawa Citizen* (November 15, 2003); also R. E. Dines, Deborah Henderson, and Louise Rock, "The Case Against Intensive Hog Operations" (working paper, February 2004).

49. Richard C. Ready and Charles W. Abdalla, "The Amenity and Disamenity Impacts of Agriculture: Estimates from a Hedonic Pricing Model," *American Journal of Agricultural Economics* 87, no. 2 (May 2005): 314–326.

than a factory farm operation." The study also finds that the clustering of AOs within a certain area is the controlling factor, not the location of the nearest operation when considering proximity. The study reports a value impact of -4.1% from AOs within 800 meters, and at least -6.4% from within 500 meters, both of which were half the impact of a landfill at comparable distances. The study did not find any statistically significant difference in the effects based on AO size or species.

Herriges, Secchi, and Babock expand upon previous work on AO price effects by using variables to quantify the effects in a hedonic analysis of proximity, size, and direction of nearest facility. Direction from site was included to determine the effect of being downwind, and the odor and pest issues associated with AOs. Results from this study indicate that a moderate-size facility has a value impact up to -6% within 1.5 miles and -26% within a 0.25 mile.[50]

Finally, Keske documents ten lawsuits over AO nuisance in which the plaintiff prevailed, with jury awards ranging up to $50 million (Table 2). The size of these awards suggests that preventive measures, even if expensive, might be cost effective.[51]

Summary of AO Empirical Findings

The establishment of an AO results in value diminution to nearby properties, both through a negative externality as well as through indirect economic impacts. The amount of the value loss is an inverse function of distance (closer properties diminish more), a function of property type (newer, nicer residences lose more), and a function of property use (farms will lose value due to diminished productivity and comparative marketability to farm lands further away; residential use will no longer be a highest-and-best use). The empirical studies and case studies results indicate diminished marketability, loss of use and enjoyment, and loss of exclusivity that can range up to nearly 90% of otherwise unimpaired value for homes that are adjacent to the facility. Negative impacts are noted at distances exceeding 3 miles, and in the case of a flood or other weather event, waste from the facility can be spread over far greater areas, extending the area of negative impact (Table 3).

Mitigation of Impacts

There is surprisingly little empirical evidence of attempts to mitigate either the physical impacts or the perception of negative externality of AOs given the fairly consistent evidence of negative impacts on surrounding property values. The most significant and transcendent impacts are to surrounding community values and economics and to air quality. However, neither of these is well suited to mitigation efforts. Generally, mitigation fall into three categories: waste management plans, tree windbreaks, and anaerobic

Table 2 Damage Awards Related to AOs

Year/State	Jury Award	Case/Remarks
1991/NE	$375,600	*Kopecky v. National Farms*, swine operation
1996/KS	$12,100	Swine settlement – parties undisclosed in news article
1998/KS	> $15,000	*Twietmeyer v. Blocker*, beef operations
1999/MO	$5,200,000	*Hanes v. Continental Grain*, swine operation
2001/OH	$19,182,483	*Seelke v. Buckey Egg Farm*, poultry
2002/IA	$33,065,000	*Blass v. Iowa Select Farms*, swine operation
2004/OH	$50,000,000	*Bear v. Buckey Egg Farm*, poultry
2006/AL	$100,000	*Sierra Club v. Whitaker*, swine
2006/MO	$4,500,000	*Turner v. Premium Standard Farms*, swine
2007/IL	$27,000	State of Illinois (respondent unreported), swine

Source: Catherine M. H. Keske, "Determining the Economic Feasibility of Anaerobic Digestion in Colorado: Guidelines for Animal Farm Producers," CSU Extension Fact Sheet 1.229 (2012).

50. Herriges, Secchi, and Babcock, "Living with Hogs in Iowa."

51. Catherine M. H. Keske, "Determining the Economic Feasibility of Anaerobic Digestion in Colorado: Guidelines for Animal Farm Producers," CSU Extension Fact Sheet 1.229 (2012), http://www.ext.colostate.edu/pubs/livestk/01229.pdf.

Table 3 Summary of Studies of AO Value Impacts

Case Study	Value Loss	Remarks
Ables-Allison and Connor (1990)	$430 within 5 miles	Greatest impact within 1.6 miles
Taff, Tiffany, and Weisberg (1996)	N/A	AO sited near older, less-expensive homes
Palmquist, Roka, and Vukina (1997)	9%	Average up to 2 miles
Hamed Johnson, and Miller (1999)	6.6%—88%	Largest loss if within 0.10 mile
ABA Presentation (1999)	N/A	Confirmed respiratory problems
Central Industries (2000)	60% for farms closest to plant	USDOJ cases, values by appraisal
Beasley (2001)	Up to 30%	Impacts 10% at 1.5 miles
Aiken (2002)	30% @ 0.75 mile	Confirmed by court and local appraiser
Spears (2003)	N/A	40 km of beaches closed due to AO emissions
Herriges, Secchi, and Babcock (2003)	26% at 0.25 mile	Moderate-size AO, 6% at 1.5 miles
Weida (2004)	40% at 0.50 mile	10% at 2 miles
Ready and Abdalla (2005)	Residence at 0.25 mile > 6.4% Residence at 0.50 mile 4.1%	Roughly half the impact of a landfill
Kim and Goldsmith (2008)	23.5% at 1 mile	18% average within 3-mile radius
Isakson and Ecker (2008)	44%	Directly downwind and within 2 miles

Source: Catherine M. H. Keske, "Determining the Economic Feasibility of Anaerobic Digestion in Colorado: Guidelines for Animal Farm Producers," CSU Extension Fact Sheet 1.229 (2012).

digestion. Nonetheless, such mitigation does not appear to have an economically material impact on nearby property values.

Waste Management Plan

Laws or regulations typically require wastewater runoff treatment. However, some facilities go beyond that with actual waste management plans. There is some evidence that such plans will have marginal impact, as noted in the Ready and Abdalla study, which found a residential value differential of 4.2% versus 1.1%. Notably though, some of the most severe impacts have occurred near facilities with mandated waste management plans, particularly when and after those plans failed. For example, in one four-month period, the Central Industries facility studied by Ready and Abdalla committed approximately 1,114 permit violations, exceeding the pollutant limitations set forth in the company's permit by hundreds of percentage points and exceeding its permitted flow rate by millions of gallons. Hence, the efficacy of a waste management plan must be taken in the light of potential impacts of violations.[52]

Planting Trees

The University of Delaware, College of Agriculture and Natural Resources, studied the planting of windbreaks around poultry houses to reduce odor, dust, feathers, and noises, and suggests that this approach can also ameliorate nitrogen in the groundwater.[53] However, several aspects regarding this mitigation study should be noted:

1. The study focus is on protecting the poultry houses themselves, not adjacent or nearby neighbors.
2. Establishment of an effective windbreak takes quite a few years and quite a few trees.
3. A windbreak may partially ameliorate view problems but does not seem to address the major issues of odor and other airborne contaminations (particles, insects, etc.).

Anaerobic Digestion Facility

The purpose of Keske's study was to provide guidance on the financial feasibility of a biogas-fueled cogeneration facility.[54] The study recognizes the significant production of flammable biogas by AOs and notes the feasibility of biogas-fueled cogeneration

52. Ready and Abdalla, "The Amenity and Disamenity Impacts of Agriculture."

53. George W. Malone, "Environmental and Production Benefits of Trees for Poultry Farms," U. Delaware Cooperative Extension Service (2001).

54. Keske, "Determining the Economic Feasibility of Anaerobic Digestion."

is limited by a number of factors. First, the up-front costs can be prohibitive—typically $1.2 million, and up to $5 million depending on the technology used. Also, annual operating costs are significant, and while these technologies are sold with the promise of offsetting electric bills, Keske notes that in the study area (Colorado) electricity rates are already lower than other parts of the United States. Hence, AO operators should be "particularly wary of relying on anaerobic digestion to generate revenues by selling electricity to the utility." Finally, Keske notes that for a biogeneration facility to be feasible, at least two of the following criteria must be met:

1. The AO meets the definition of a confined AFO.
2. The waste stream can be combined with the waste stream of another operation or business (e.g., food manufacturing, municipal waste).
3. The AFO already receives frequent odor complaints.
4. The AFO produces swine or chickens (the two most egregious sources of biogas).
5. The AFO incurs more than $5,000/month in average electricity or heating charges.

Keske notes that given the high threshold of cost of this mitigation approach, the approach is feasible only if it outweighs costs associated with not implementing a mitigation plan. As previously mentioned, to support this Keske documents ten lawsuits in which claimants were awarded as much as $50 million for agricultural nuisance (Table 2). Notably, the two largest awards cited ($50 million and $19 million) were for poultry operations.[55]

Summary and Conclusions

Since *The Appraisal Journal*'s previous review of AO effects on proximate property values,[56] new study approaches have been identified. First, there has been an increased use of GIS by local governments, which has given researchers the ability to conduct more thorough investigations. GIS provides researchers with more data—in abundance and in detail—and allows researchers to better locate which factors, and to what degree, have an effect on value.

Second, in conjunction with more data and use of GIS, there are substantial improvements in the hedonic analyses performed. Keske noted that early studies (such as the Taff, Tiffany and Weisberg study and the Palmquist, Roka, and Vukina study) were conducted on fewer than 300 sales transactions each, while the later study by Ready and Abdalla reviewed 8,090 sales, and the Herriges, Secchi, and Babcock study examined 1,145 sales transactions.

Third, because of the increased use of GIS and the results from the hedonic analysis in newer case studies, it has been shown that an AO's basic impact is related to proximity and size, but there are also other factors, such as the operations' waste management practices, that can reduce or exacerbate that impact. Overall, the new studies confirm the valuation impacts reported in earlier studies, as they range from 3.1% to 26% loss depending on multiple factors, and that properties immediately abutting an AO can be diminished as much as 88%. More importantly, however, is the discussion of the impact of other site-specific factors that were considered as part the hedonic analyses.

With respect to mitigation efforts, the Ready and Abdalla study of Berks County (Pennsylvania) shows that at 800 meters an operation with a waste management plan diminishes a house's value 1.1%, while an operation without such a plan would diminish the value 4.2%. Also related to this is the effect of operation size on property values. Both the Ready and Abdalla study and the Herriges, Secchi, and Babcock study show that a larger facility in close proximity would not necessarily decrease the value of a nearby property more than a smaller facility. Both of the studies concluded that this effect could be attributed to unmodeled characteristics such as waste management practices and other site-specific attributes.

55. Ibid.

56. Kilpatrick, "Concentrated Animal Feeding Operations."

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Web Connections

Internet resources suggested by the Y. T. and Louise Lee Lum Library

eXtension Land-Grant University Cooperative Research Information
—Geospatial Technology
http://www.extension.org/geospatial_technology

–Animal Manure Management
http://www.extension.org/animal_manure_management

Food & Water Watch—Factory Farms
http://www.foodandwaterwatch.org/food/factoryfarms/

Texas A&M University, Texas Animal Management Issues Clearinghouse
http://tammi.tamu.edu/index.html

US Department of Agriculture, National Agricultural Library
http://www.nal.usda.gov/topics

US Environmental Protection Agency
—Agriculture Center
http://www.epa.gov/agriculture

—Drinking Water Regulations
http://water.epa.gov/lawsregs/rulesregs/sdwa/currentregulations.cfm

—Animal Feeding Operations Overview
http://water.epa.gov/polwaste/npdes/afo/index.cfm

What's that smell? Life near Toronto's downtown slaughterhouse

BY NEWS STAFF (HTTPS://TORONTO.CITYNEWS.CA/AUTHOR/NEWS-STAFF)
POSTED MAY 4, 2012 7:44 AM EDT

A stroll along King Street West on a summer's day can be an assault on the nostrils, and while some residents of the Niagara neighbourhood west of Bathurst say the stench emanating from the nearby pig slaughterhouse isn't pleasant, they admit it's bearable.

The stink may be even more tolerable for people looking to buy or rent in the area with slightly lower real estate prices around the Quality Meat Packers plant at the foot of Tecumseth Street.

"You end up getting used to it," local resident Sabrina Mancini said of the smell.

The slaughterhouse began operating as a municipal facility in 1914. Quality Meat took over in 1960 and it has no plans to move, but condominium developers are ready to swoop in should the company change its mind.

"It's a big site and I know for a fact that developers — their intention is to develop it once it's no longer viable for their industrial operation," local councillor Mike Layton told CityNews.

While it's easy to think of the negatives of having a century-old abattoir sandwiched between the booming club district to the east near Spadina, and the trendy Liberty Village to the west near Dufferin, there are some significant benefits: it keeps ever-escalating real-estate prices in check and provides hundreds of manufacturing jobs close to the downtown core.

Smell versus price

Nick Johnson, vice president of human resources at Quality Meat, said the company maintains a good relationship with its neighbours and as condominiums continue to sprout up around King West, the slaughterhouse helps keep real estate prices at relatively reasonable levels.

“[Residents] are happy with us being here knowing that it will keep the major re-gentrification of the neighbourhood at arm’s length,” he said.

“So most of these people are looking for affordable property or affordable rent and part of that means they’re in a neighbourhood that’s still semi-industrial.”

Downtown real estate agent Lisa Munro said the slaughterhouse does keep prices down in the popular area.

“You can save a bit of money. As soon as you get north of Queen there’s a percentage increase,” she said.

Munro said property prices around the slaughterhouse are between 15 and 20 per cent lower than homes in other areas not affected by the stink.

“It’s a stigma,” she said. “It affects the value for sure.”

A vestige of Niagara neighbourhood’s industrial past

The Quality Meat plant could very well be the last vestige of the area’s industrial past. Another manufacturing business — Morgan Solar on nearby Ordnance Avenue — is moving out and will be replaced by residential units.

“We’re landlocked here. We’ve squeezed every square inch we can out of the space we have. All of our growth will have to be elsewhere – that was the reason for moving into the Mitchell market,” Quality Meat’s Nick Johnson said of the company’s facility near Stratford, Ont.

Both Layton and Johnson said the few complaints about the smell usually come from condo dwellers new to the area who may not have been informed they were purchasing a unit so close to a meat processing plant.

That number of complaints could rise in the future: an application has been filed to transform a heritage property directly across the street at 109 Niagara St. — the home of a former casket company dubbed “the coffin factory” — into two condo towers, 15 and 19 storeys tall.

Odour acceptance

Local residents admit the smell isn’t pleasant, but it’s familiar.

“It’s not as bad as it used to be. But it’s worse if you’re west of the plant,” said a resident named Clayton who’s lived in the area for more than 20 years.

Sabrina Mancini has lived in a Niagara neighbourhood condo building for five years.

“[The smell] can definitely be challenging at times. The smell either comes in wafts — you smell it and then it’s gone. But sometimes the smell is there and doesn’t go anywhere. It also has different degrees of stinkiness,” she said.

“The more predominant smell is manure-like and although it’s not welcomed, it’s bearable. ”

Another resident named Yarek who lives at Niagara and Tecumseth streets equates the smell of his neighbourhood with a more rural experience.

“It’s just the smell of manure right? So it’s just like coming to a farm,” he said. “That’s how I cope.”

Mancini said she’s always surprised to see packed patios in the area on the particularly smelly summer days, but Shane Connolly, manager of the Foggy Dew pub on King Street, said the slaughterhouse hasn’t hurt business.

“The smell definitely comes by our restaurant quite a bit in the summer,” he said. “There’s nothing we can do about it. I’ve never filed a complaint.”

“Our patio’s full when it’s sunny, with or without [the smell].”

Smells and sounds

Aside from the stink, the constant stream of trucks flowing to and from the plant is also a big concern for locals.

“There are houses there — little workers cottages — that have been there for a long, long time and I think those neighbours are more concerned over the trucks rather than the smell,” Layton said.

Johnson admits delivery and shipping is one of the biggest challenges of running a downtown abattoir, but says the company has measures in place to ensure it remains a good neighbour.

“We have very strict times about when [trucks] can and can’t arrive,” Johnson said. “And when they get here they’re not allowed to use their back-up alarms before 7 a.m.”

Local resident Clayton said the trucks are noisy but he said living near the facility is a trade-off.

“There’s a lot of people being employed,” he said. “There’s the ying and the yang.”

Layton also noted the abattoir provides “hundreds and hundreds of jobs downtown.”

“[Quality Meat] is really an industrial manufacturing operation —maybe one of the last ones in the core,” he said.

The facility is part of a dying breed of urban slaughterhouses, Johnson said.

“The American ones, due to scale, have moved right out — not just out of the city but right out to the rural communities,” he said.

“Some of the other cities that typically had meat-packing districts, like Winnipeg — that’s completely shut down … there are no slaughterhouses in downtown Winnipeg anymore. Same in Edmonton [aside from a few poultry processing plants].”

Meat processing facilities also continue to operate in the west end near St. Clair Avenue and Keele Street and those facilities have drawn complaints from new residents in nearby townhomes.

BROWSE

ABATTOIR (HTTPS://TORONTO.CITYNEWS.CA/TAG/ABATTOIR/) | CIVIC (HTTPS://TORONTO.CITYNEWS.CA/TAG/CIVIC/) | CONDOS (HTTPS://TORONTO.CITYNEWS.CA/TAG/CONDOS/) | COUN. MIKE LAYTON (HTTPS://TORONTO.CITYNEWS.CA/TAG/COUN-MIKE-LAYTON/) | DOWNTOWN (HTTPS://TORONTO.CITYNEWS.CA/TAG/DOWNTOWN/) | HISTORIC (HTTPS://TORONTO.CITYNEWS.CA/TAG/HISTORIC/) | KING AND BATHURST (HTTPS://TORONTO.CITYNEWS.CA/TAG/KING-AND-BATHURST/) | LISA MUNRO (HTTPS://TORONTO.CITYNEWS.CA/TAG/LISA-MUNRO/) | MEAT PROCESSING PLANT (HTTPS://TORONTO.CITYNEWS.CA/TAG/MEAT-PROCESSING-PLANT/) | MUNICIPAL (HTTPS://TORONTO.CITYNEWS.CA/TAG/MUNICIPAL/) | NIAGARA NEIGHBOURHOOD (HTTPS://TORONTO.CITYNEWS.CA/TAG/NIAGARA-NEIGHBOURHOOD/) | ODOUR (HTTPS://TORONTO.CITYNEWS.CA/TAG/ODOUR/) | PIGS (HTTPS://TORONTO.CITYNEWS.CA/TAG/PIGS/) | PRICES (HTTPS://TORONTO.CITYNEWS.CA/TAG/PRICES/) | QUALITY MEATS (HTTPS://TORONTO.CITYNEWS.CA/TAG/QUALITY-MEATS/) | REAL ESTATE (HTTPS://TORONTO.CITYNEWS.CA/TAG/REAL-ESTATE/) | RENT (HTTPS://TORONTO.CITYNEWS.CA/TAG/RENT/) | RESIDENTS (HTTPS://TORONTO.CITYNEWS.CA/TAG/RESIDENTS/) | SLAUGHTERHOUSE (HTTPS://TORONTO.CITYNEWS.CA/TAG/SLAUGHTERHOUSE/) | SMELL (HTTPS://TORONTO.CITYNEWS.CA/TAG/SMELL/) | STINK (HTTPS://TORONTO.CITYNEWS.CA/TAG/STINK/) | TECUMSETH STREET (HTTPS://TORONTO.CITYNEWS.CA/TAG/TECUMSETH-STREET/) | THE FOGGY DEW (HTTPS://TORONTO.CITYNEWS.CA/TAG/THE-FOGGY-DEW/) | TORONTO (HTTPS://TORONTO.CITYNEWS.CA/TAG/TORONTO/)

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MARCH 5, 2019 BY LPELC ADMIN

Common Manure Test Results Conversions

When developing your manure nutrient management plan, getting a good sample and receiving your manure test results is only the first step. After you get your test results, you need to ensure that the units (pounds, gallons, etc.) in the report match the units that are used in your plan. When they do not match, how can you make the conversions?

Note: *Phosphorus is used in these examples, but the calculations are the same for all nutrients.*

Converting Dry Matter to "As-Is"

There are two formulas for converting manure analyses results from % dry-weight (% dwt) or ppm to "as-is" results. One is used when your analysis is expressed in lb/ton and the

other is for lb/1000 gal.

lb/ton as sampled = (% Solids/100) x (% Analysis dwt/100[1]) x 2000 lb/ton

lb/1000 gal = (% Solids/100) x (% Analysis dwt/100[1]) x (density[2] lb/gal x 1000)

[1]For results in ppm replace 100 with 1,000,000
[2]To do this the density of the manure must be known. Liquid manure density can vary from 8-9 lb/gal, but will typically have a density around 8.3 to 8.5 lb/gal. Manure density can be easily estimated with a 5 gallon bucket and a set of scales. See estimating manure density.

Examples

A. *Manure Analysis: 10.5% solids, 1.4% P dwt*

(10.5% solids/100) x (1.4% P/100) x 2000 = 2.9 lb P/ton

B. *Manure Analysis: 10.5% solids, 14,000 ppm P dwt, Manure density 8.3 lb/gal*

(10.5% solids/100) x (14,000 ppm P/1,000,000) x (8.3 lb/gal x 1000 gal) = 12.2 lb P/1000 gal

Converting Manure Analysis Results From Elemental to Oxide

Standard Conversion Factors: P x 2.3 = P_2O_5; K x 1.2 = K_2O

Examples

A. *Manure Analysis: 2.9 lb P/ton*

2.9 lb P/ton x 2.3 = 6.7 lb P_2O_5/ton

B. *Manure Analysis: 12.2 lb P/1000 gal*

12.2 lb P/1000 gal x 2.3 = 28.1 lb P_2O_5/1000 gal

Converting Manure Analysis Results from Liquid to Solid Or Solid to Liquid

To do this the density of the manure must be known. Liquid manure density usually varies from 8-9 lb/gal. Manure density can be easily estimated with a 5 gallon bucket and a set of scales. Liquid manures typically have a density around 8.3 to 8.5 lb/gal. Estimating Manure Density.

lb/ton = lb/1000 gal ÷ (density lb/gal x 1000) x 2000 lb/ton

OR

lb/1000gal = lb/ton x (density lb/gal x 1000) ÷ 2000

Examples

A. *Manure Analysis: 28.1 lb P_2O_5 /1000 gal , Manure density estimated at 8.3 lb/gal*

28.1 lb P_2O_5 /1000 gal ÷ (8.3 lb/gal x 1000) x 2000 = 6.7 lb P2O5 /ton

B. *Manure Analysis: 6.7 lb P_2O_5 /ton , Manure density estimated at 8.3 lb/gal*

6.7 lb P_2O_5 /ton x (8.3 lb/gal x 1000) ÷ 2000 = 28.1 lb P205 /1000 gal

Related Manure Testing Web Pages

- Overview of Manure Testing
- Step 1. Manure Sampling
  - Solid Manure Sampling Procedures
  - Liquid Manure Sampling Procedures
- Step 2. Manure Test Results
- Step 3. Total and Available Nutrients
  - Common Manure Test Results Conversions (you are here)
    - Estimating Manure Density
- Step 4. Manure Test Record Keeping

Authors: Doug Beegle, Pennsylvania State University and John Peters, University of Wisconsin

MANURE NUTRIENTS

MANURE TESTING MANURE ANALYSIS

Living with Hogs in Iowa: The Impact of Livestock Facilities on Rural Residential Property Values

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Abstract

To better understand the magnitude of the effects of livestock feeding operations on residential property values, we constructed a new dataset that merges data on home sales with data on the location and size of livestock feeding operations in five rural counties of Iowa. We estimated a hedonic model to explain variations in residential sales price with standard house attributes, such as number of bedrooms and square feet of living space, as well as the effects of distance and density of livestock feeding operation. We find that livestock operations have an overall statistically significant effect on property values. Predicted negative effects are largest for properties that are downwind and close to livestock operations. In addition, feeding operations that are moderate in size have more impact than do large-scale operations, most likely reflecting age, type, and management practices of the moderate-sized operations. The limited size of the estimated effects suggest that common sense rules—such as not locating feeding operations close to and upwind of residences—combined with modest compensatory payments could help rural residences co-exist with modern feeding operations.

Keywords: hedonic model, livestock, property values.

LIVING WITH HOGS IN IOWA: THE IMPACT OF LIVESTOCK FACILITIES ON RURAL RESIDENTIAL PROPERTY VALUES

Introduction

The methods used to raise hogs in Iowa have undergone dramatic changes in the past twenty years. In 1980, approximately 65,000 farmers in the state raised hogs, with an average of 200 hogs residing on each farm. In 2002, the number of farms with hogs had fallen to about 10,000, and the average number of hogs per farm had risen to over 1,400.[1] In the not-so-distant past, the presence of livestock on farms was the norm. When living or traveling in rural areas, one expected to smell the smells, hear the noises, and see the sights that accompany such operations. Complaints between rural neighbors about livestock operations made little sense when everybody had livestock. But the dramatic increase in the concentration of ownership now means that far fewer rural residents have a large financial interest in livestock. What once was the smell of money is now the smell of somebody else's money and an externality to be dealt with. Moreover, there is a concern that the increased concentration of the industry may be accompanied by an increased risk of environmental damage due to manure spills and further degradation of local air quality as the result of odor emanating from large-scale hog facilities.

Accompanying the changes in the industry's structure has been an increase in complaints about livestock operations. State and local agencies have responded by enacting regulations for large-scale confinement units. Since 1995, the Iowa legislature has passed three progressively stricter bills regulating livestock operations. The most recent bill, Senate File 2293, provides for a lower size threshold at which a construction permit is required, calls for larger separation distances for livestock operations, and regulates air quality by limiting emissions from confinement operations.[2] In addition to such legislative action, since the Iowa Supreme Court in 1998 limited the immunity granted to farmers raising livestock, there have been several instances in which individual landowners have filed lawsuits against hog facilities. The best-known case involves four farm couples—two of whom had raised livestock—who sued Iowa Select Farms in 2002

for the production of offensive odors, noxious gasses, and excessive flies on the company's 30,000-head hog facility in Sac County, Iowa. The plaintiffs were awarded $1.06 million in actual damages plus $32 million in punitive damages.[3] The case was settled out of court in 2003, but the terms of the settlement are confidential.

The problem facing both regulators and the judicial system is that little information exists on the extent of damages caused by livestock facilities, making regulation and assessment of damages in civil suits that much more difficult. Palmquist, Roka, and Vukina 1997 (PRV hereafter) represents one of the few studies available. Using data on 237 rural residential properties in southeastern North Carolina, PRV conducted a hedonic price analysis. The authors found that proximity to hog facilities caused a statistically significant reduction in rural housing prices, with an impact of as much as 9 percent for a facility located within ½ mile of a home. A limitation of the PRV study is that the authors did not have information on the exact location of the hog operations. Instead, the authors were forced to rely on an index of manure production within three radii of each home sale (0 to ½ mile, ½ to 1 mile, and 1 to 2 miles) provided by the state veterinarian's office. This precluded the authors from controlling for whether facilities were upwind or downwind of the residential site or the specific distance to the nearest facility. Moreover, the authors did not control for the potentially positive impact that growth in the local livestock industry might have on the demand for housing in the region.

The purpose of this paper is to address some of the limitations inherent in data available for the PRV study by using GIS (geographical information systems) data on the location of livestock facilities in Iowa. Specifically, we conducted a hedonic analysis of the impact of livestock facilities on rural residential property values. We collected data on 1,145 actual home sales in five counties (Franklin, Hamilton, Hardin, Humboldt, and Webster) for the period from 1992 through the summer of 2002. We merged these data with information from the Iowa Department of Natural Resources (IDNR) on the location and size of livestock operations requiring either a construction permit or a manure management plan to determine how close each home was to livestock facilities. The livestock operations database used in the analysis includes facilities regulated according to the 1998 law, House File 2494, which required operations with an animal weight capacity in excess of 200,000 pounds (400,000 for bovine facilities) to file a manure

management plan. Construction permits were required for facilities over 625,000 pounds of bodyweight (roughly 4,167 finishing hogs) that used formed storage.[4] For each residence, we identified the nearest livestock operation, recording the operation's distance from the home, its size (live weight), and whether it was upwind of the home during the winter (i.e., northwest) or summer (i.e., south) seasons. We also computed the number of operations within a 3- and 10-mile radius to control for concentration effects and the indirect impact of industry growth on housing demand.

Literature Review

Hedonic price models have long been used to value not only the physical attributes of housing units (e.g., square footage, number of bathrooms, and air conditioning) but also the surrounding location and environmental amenities (e.g., local school quality, crime rates, and air quality).[5] Drawing on seminal work by Rosen (1974), hedonic property value studies start with the notion that the price of a home (P) reflects the bundle of attributes associated with it; that is,

$$P = P\left(z_1, z_2, \ldots, z_K\right) \tag{1}$$

where $\mathbf{z} = \left(z_1, z_2, \ldots, z_K\right)$ is a vector of housing attributes. The hedonic function in equation (1) is a housing market equilibrium resulting from the interplay between consumers' demands for various bundles of attributes and suppliers' costs of providing such bundles. As such, it can be used to value marginal changes in a given attribute (say, z_k) using

$$MV_k\left(\mathbf{z}\right) = \frac{\partial P\left(\mathbf{z}\right)}{\partial z_k}. \tag{2}$$

However, one must be careful in using the hedonic function to measure large (i.e., non-marginal) changes in the set of housing amenities, as this may result in a change in the market equilibrium. According to PRV (p. 115), if the changes are localized (and hence not likely to alter substantially the local housing market), the hedonic function can be

used to value changes in local environmental amenities. Moreover, they argue that this is likely to be the case in considering the impact of locating a new hog facility.

The empirical literature that employs hedonic analysis to value environmental amenities is substantial in both the size and scope of amenities being valued. For example, Smith and Huang (1995) use meta-analysis to summarize nearly 40 studies of the impact of air quality on housing prices. Perhaps more relevant to the current analysis are those studies focused on Locally Undesirable Land Uses (or LULUs), including landfills, hazardous waste sites, and incinerators.[6] For example, Kohlhase (1991), Kiel (1995), McCluskey and Rausser (2001), and Smith and Desvousges (1986) all estimate the impact of hazardous waste sites on residential property values and typically find that home values are significantly reduced by proximity to such disposal sites. Similar results emerge in studying the impact of incinerator sites (Kiel and McClain 1995a,b) and landfills (Thayer, Albers, and Rahmatian 1992; Reichert, Small, and Mohanty 1992).

As previously noted, however, there are relatively few studies that focus on the impact of livestock facilities on property values, with PRV being perhaps the most well-known to date. An earlier hedonic analysis by Abeles-Allison and Conner (1990) also found a significant impact of hog facilities on property values in Michigan. However, the analysis was subject to potential sample selection bias, as properties studied were limited to those located near hog facilities for which multiple complaints had been received. Taff, Tiffany, and Weisberg (1996) and Mubarak, Johnson, and Miller (1999) conducted property value studies in Minnesota and Missouri, respectively, but were hampered by limited information on the characteristics of the properties being sold. Moreover, in the Missouri study, over 60 percent of the parcels did not include a home; those that did include a home did not control for the homes' structural characteristics. The Minnesota study, on the other hand, used only house sales data but included property located in cities or townships with populations of 2,500 people or less. It therefore did not distinguish between rural and urban sales, and it had very little information on the characteristics of the properties sold.[7] To our knowledge, the only other hedonic study that controls for the presence of livestock facilities is a recent paper by Ready and Abdalla (2003), which analyzes single-family home sales in Berks County, Pennsylvania. In this study, the authors estimate a hedonic price function, including as housing

amenities the proximity of each home to open space and disamenities, such as landfills, regional airports, and large animal production facilities. The authors find that a large animal production facility located at a distance of 500 meters (or roughly 0.3 miles) depresses the sales price of a home by 6.4 percent. However, the authors do not control for the direction of the housing unit relative to the livestock facility.

Data Collection

The study area (shaded in Figure 1) includes five counties in North-Central Iowa: Franklin, Hamilton, Hardin, Humboldt, and Webster.[8] We chose this area because there is a wide range of livestock operations in the region. As the inset map in Figure 1 indicates, the areas with lower density are the two western counties, with Webster and Humboldt counties having only 16 and 24 operations, respectively. Hamilton County, on the other hand, has 138 operations, Franklin has 76, and Hardin has 95. Moreover, the counties differ in terms of the mix of operation sizes. Whereas Franklin County has the largest share of moderate-sized facilities (i.e., hog facilities with less than 3,000 head),

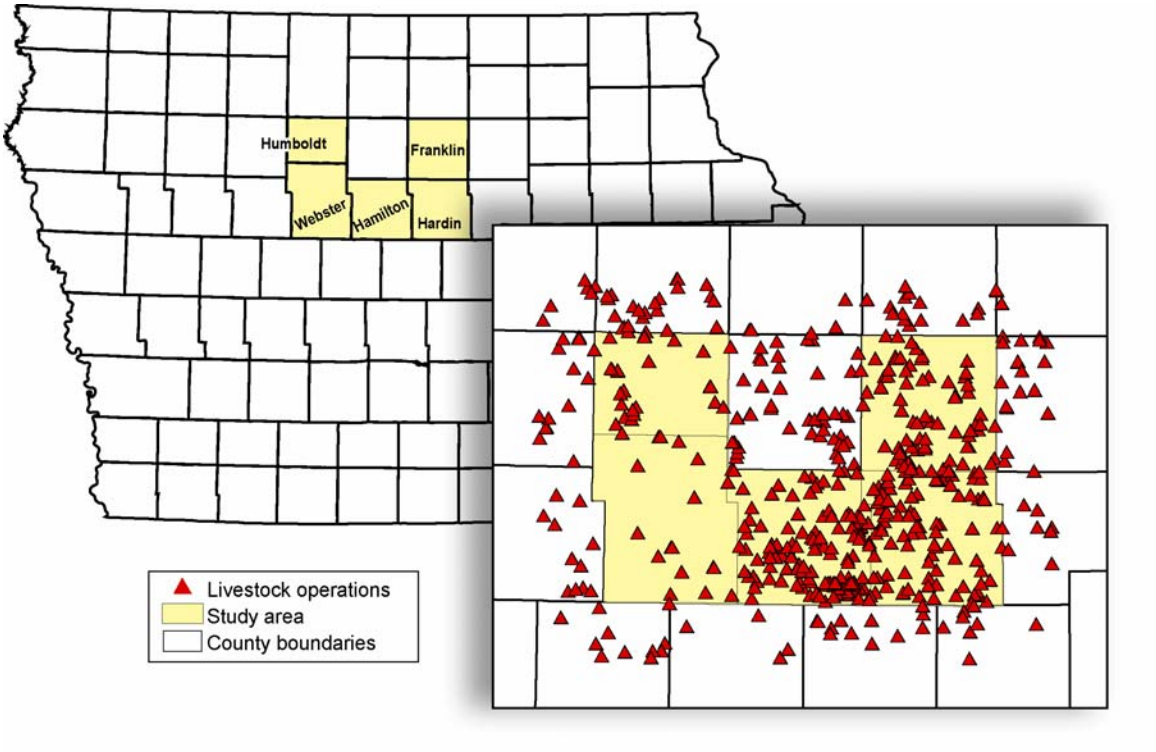

FIGURE 1. Study area

Hamilton County has the greatest number of larger facilities (i.e., over 3,000 head).[9] Over 90 percent of the facilities are hog operations, mostly growers, and the majority of them were built in the early to mid-1990s.

Livestock Facilities Data

Information on each livestock facility in the study area was obtained from the IDNR. The available data included the GIS files on the location of the operations as well as the live weight and animal type in production. We identified two types of operations using the IDNR data: facilities that need a construction permit and facilities that need to file a manure management plan with the agency. In general, according to the 1998 Iowa law, any operation with an animal weight capacity of more than 200,000 pounds (400,000 pounds bovine) must obtain a manure management permit. If a facility uses earthen storage structures for manure, such as a lagoon, it must also obtain a construction permit. If a facility uses formed storage, on the other hand, it needs a construction permit only for operations with 625,000 or more of animal weight capacity (1.6 million pounds or more for bovine).

In total, 550 livestock facilities are included in our analysis.[10] Table 1 provides summary statistics for these facilities. Because of the structure of the confinement operation dataset, the facilities included tend to be quite sizable.[11] As Table 1 indicates,

TABLE 1. Livestock facilities summary statistics

Characteristic	Mean	Median	Range
Live weight (thousands of pounds)	727	600	120 to 41,044
Manure index (millions of pounds per year)	17	14	3 to 973
Percentage of operations by type			
Hogs	98		
Cattle	1		
Hen	2		
Percentage of operations by county			
Franklin	14		
Hamilton	25		
Hardin	17		
Humbolt	4		
Webster	3		
Other	37		

their live weight ranges from 120,000 to 41,044,000 pounds, with a median of 600,000 and an average of 727,000.[12] Over 97 percent of the facilities are hog confinement units, 1 percent are cattle operations, and the remaining 2 percent are egg laying facilities.

In order to provide some comparability to PRV, we also considered manure production as an alternative measure of size in our hedonic analysis. A manure index was formed for each facility based on type of facility and using the algorithms developed by Lorimor, Powers, and Sutton (2000). Manure production levels, as excreted, for facilities included in the study ranged from 3 to 973 million pounds per year, with a median and mean, respectively, of 14 and 17 million pounds per year.

Residential Property Sales Data

Data on house sales were obtained from each county assessor's office. We restricted sales to rural residential, owner-occupied homes sold via "arms length" transactions between 1992 and 2002.[13] As in the case of PRV, we excluded properties with more than 10 acres in order to avoid units that were being marketed in part because of their agricultural production capabilities. We also excluded properties whose sale prices were less than 50 percent of their assessed values and/or sold for less than $5,000. In total, 1,145 sales were available for the analysis. Table 2 details the number of sales and earliest sale date by county.

The variables used in the hedonic regression analysis fall into three broad categories: (*a*) the physical attributes of the home and lot (e.g., square footage and number of bathrooms), (*b*) the attributes of the surrounding community, and (*c*) the attributes of the livestock facilities in close proximity to each home. The physical characteristics available for each home varied by county. In total, 11 characteristic were formed using the overlap in information across the five counties, including the size of the lot, the age of the home,

TABLE 2. Rural residential property sales by county

County	Earliest Sales Date	Number of Sales
Franklin	January 1993	141
Hamilton	January 1992	190
Hardin	January 1995	177
Humboldt	March 1995	71
Webster	January 1992	566

and the year in which it was sold, the size of the living area and any additions to the home, and the number of bathrooms, decks and fireplaces. These characteristics, listed in the first part of Table 3, are similar to those used in PRV and other hedonic studies of residential properties. Each of these characteristics, with the exception of the age of the home, is expected to have a positive impact on the price of the home.

The second broad category of explanatory variables (listed in the second section of Table 3) characterizes the amenities of the housing unit in terms of the surrounding community. These include the distance to the nearest large town (i.e., with population of 2,500 or more) and nearest high school, as well as the median income and population density for the corresponding township. The two distance variables required locating each household spatially. For two counties, Webster and Hardin, GIS files with parcel locations were available. For the other three, we used Digital Orthophoto Quarter Quads (DOQQs) of the State of Iowa combined with paper or online maps to create the GIS data layers.[14,15] An application called PCMiler was then used to calculate the distance from each home to both the local high school and the closest town with a population of more that 2,500 within the 10-mile buffer.[16] In general, we expected that an increase in either of these distances would negatively affect a home's sale price.

We also associated each home with the appropriate township and used the 2000 census to obtain median family income and population density (see Figure 2 for town and home locations). Population density is quite variable among the townships considered, ranging from less than 10 people per square mile to over 100. Median income is quite variable too, ranging from $32,000 to over $60,000. In the hedonic regression analysis, we anticipated that both median family income and population density would have a positive influence on sales price.

The third category of variables used in our hedonic regression analysis consists of measures of the proximity of each housing unit to livestock operations. We used Arc View 3.2 to analyze the spatial relationships between homes sold and livestock operations, constructing centroids for all property sales and livestock operations. We used these centroids to calculate distances between sales and livestock operation sites. In most hedonic studies, each sales property is associated with a single LULU site, typically the closest site. However, given the density of livestock facilities in some regions of the

TABLE 3. Description and summary statistics for variables used in hedonic analysis

Variable	Description	Units	Min	Max	Mean	Std. Dev.
Price	Market price	dollars	500,200	475,000	81,667.60	55,529.64
LSize	Lot size	acres	0.05	10	2.38	2.22
SYear	Sales year	years	1,992	2,002	1,997.16	2.76
Age	Age of home	years	0	142	52.62	32.59
LArea	Living area (without additions)	sq ft	224	500,112	1,171.67	503.84
AdArea	Area of additions	sq ft	0	1642	175.68	273.14
AC	Air conditioned	0/1	0	1	0.62	0.48
Baths	Number of bathrooms	number	0.5	6	1.58	0.68
Decks	Number of decks or enclosed porches	number	0	5	1.61	0.98
Fire	Number of fireplaces	number	0	3	0.39	0.54
AttG	= 1 if there is an attached garage; else =0	0/1	0	1	0.45	0.50
DetG	= 1 if there is a detached garage; else = 0	0/1	0	1	0.47	0.50
DistTown	Distance to nearest large town	miles	0.60	35.20	9.87	5.77
DistHS	Distance to nearest high school	miles	0.90	51.20	10.89	8.79
PDens	Population density by township	number/sq mi	4.00	116.76	29.54	26.90
MedInc	Median income by township	$1,000s /family	32.4	63.0	47.0	56.4
DI1	Distance to nearest livestock facility	miles	0.01	6.78	2.77	1.75
Size1	Size of nearest livestock facility	thousands of pounds	160	2,600	485.29	303.25
NW1	=1 if nearest livestock facility is northwest; else = 0	0/1	0	1	0.30	0.46
SO1	=1 if nearest livestock facility is south; else = 0	0/1	0	1	0.22	0.41
Mile3	Number of livestock facilities within 3 miles	number	0	27	2.48	3.39
Size3	Average size of facilities within 3 miles	thousands of pounds	0	1,649	342.18	331.77
NW3	Percentage of facilities within 3 miles that are northwest	percent	0	100	18.43	29.00
SO3	Percentage of facilities within 3 miles that are south	percent	0	100	16.72	27.78
Mile10	Number of livestock facilities that are within 10 miles	number	2	104	28.36	25.93

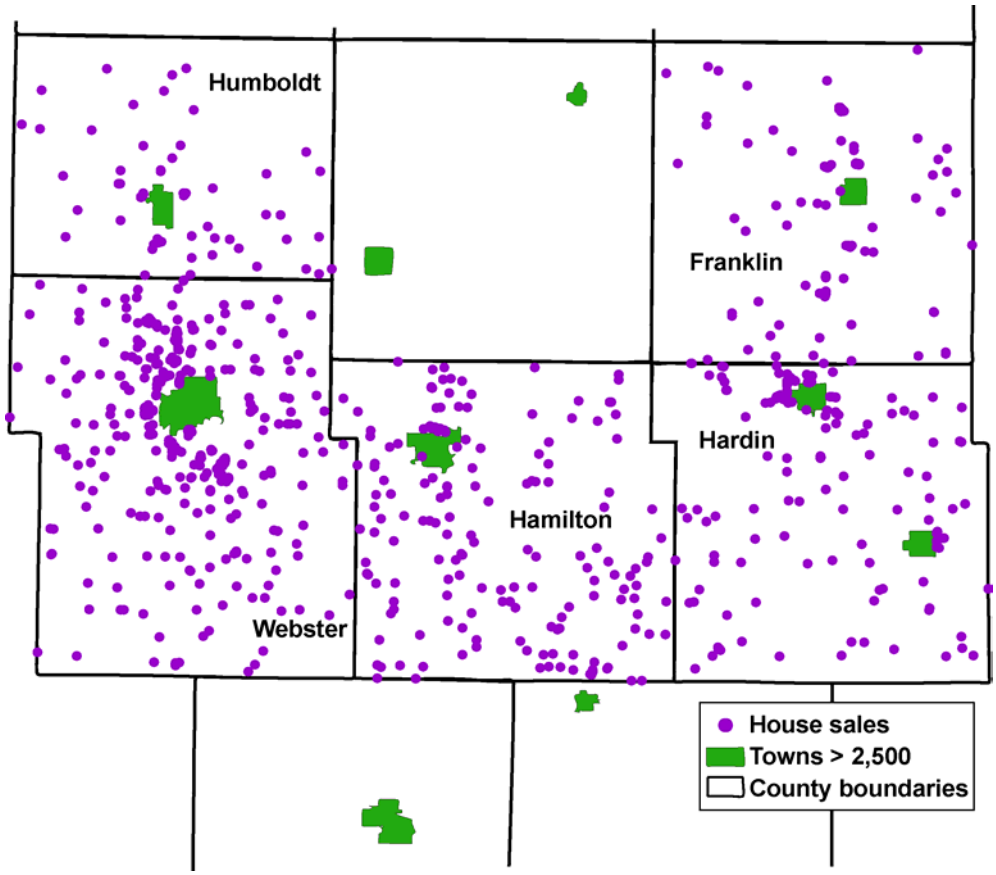

FIGURE 2. Residential sales locations

study site, we wanted to control for the possibility that a property could be affected by more than one facility. Three groups of livestock facilities were identified for each residential sales property: (*a*) the closest operation, (*b*) operations within 3 miles of the property, and (*c*) operations within 10 miles of the property. The dataset contains 47 property sales that have at least one confinement located at ½ mile or less, 149 properties with a confinement between ½ and 1 mile, and 491 properties with a confinement between 1 and 3 miles.[17] For the closest livestock operation, we calculated the distance to the property (*Dist1*), the size of the nearest livestock facility (*Size1*), and whether the facility was upwind of the property during the winter (*NW1*) or summer (*SO1*) seasons.[18] As Table 3 indicates, the average distance to the nearest livestock facility is 2.8 miles and ranges from just 0.01 to 6.8 miles. Roughly 30 percent of the nearest livestock facilities are upwind of the sales sites during the winter months and 22 percent are upwind during the summer months.

While the nearest livestock facility is likely to have the most direct impact on the residential property value, the concentration of facilities in the region also may have an impact. In addition to computing the total number of facilities within a 3-mile radius of each property (*Mile3*), we also computed the average size of these facilities (*Size3*) and the percentage that are upwind during the winter (*NW3*) and summer (*SO3*) seasons. As Table 3 indicates, there is considerable variation in the concentration of facilities around the residential sales site. While on average there are 2.5 livestock facilities within 3 miles of the properties sold, this number ranges from 0 to 27 in the data set.[19]

Finally, we calculated the number of confinements in a 10-mile radius of each property centroid. We hypothesized that the presence of a large number of confinements within such a large radius might have a positive impact on local economic activity, while the distance from the residential properties would be too large for odor to affect sale values. As Table 3 indicates, the number of livestock confinements in the 10-mile radius averages 28.4 and ranges from 2 to 104.

Model Specification and Hypotheses

Theory provides little or no guidance in terms of the choice of functional form for the hedonic price function. Instead, it is standard practice to consider a variety of functional forms in order to determine the sensitivity of the results to form choice and to choose the form that provides the best fit to the data. We investigate four broad classes of models in the current analysis:

$$\text{Model 1: } P_i = \alpha' Z_i + \left(\beta' X_{1i}\right) DI_i^{-1} + \left(\delta' X_{3i}\right) Mile3_i + \gamma Mile10_i, \tag{3}$$

$$\text{Model 2: } \ln\left(P_i\right) = \alpha' Z_i + \left(\beta' X_{1i}\right) DI_i^{-1} + \left(\delta' X_{3i}\right) Mile3_i + \gamma Mile10_i, \tag{4}$$

$$\text{Model 3: } P_i = \alpha' Z_i + \left(\beta' X_{1i}\right) \ln\left(DI_i\right) + \left(\delta' X_{3i}\right) Mile3_i + \gamma Mile10_i, \tag{5}$$

and

$$\text{Model 4: } \ln\left(P_i\right) = \alpha' Z_i + \left(\beta' X_{1i}\right) \ln\left(DI_i\right) + \left(\delta' X_{3i}\right) Mile3_i + \gamma Mile10_i, \tag{6}$$

where Z_i denotes the vector of structural and location characteristics for each sales unit (i.e., the first two sets of variables in Table 3), X_{1i} denotes the vector of characteristics of the nearest livestock facility for each home (i.e., size and wind direction dummies), and X_{i3} denotes the vector of characteristics of the facilities within 3 miles of each home. The differences among the four groups of models lie in the forms of the dependent variable and the distance to the nearest livestock facility. Models 1 and 3 have the sales price enter linearly, whereas Models 2 and 4 use log-price as the dependent variable. In Models 1 and 2, the inverse distance to the nearest livestock facility is used, whereas in Models 3 and 4, the distance to the nearest livestock facility enters in logarithmic form.[20] In general, the results of the hedonic regression analysis were similar across these four classes of models. However, Model 4 (the double-log specification) provided the best fit.[21]

In addition to the basic model variations in equations (3) through (6), two alternative measures of size were used for each livestock facility: live weight (pounds) and manure production (pounds per year). Again, the qualitative finding reported as follows did not change with the choice of these size measures. However, the models that include the live weight measure dominated those based on manure production. In the results section, we report only the results based on live weight measure. Thus, using the notation for the variables listed in Table 3, the final model becomes

$$\begin{aligned}\ln\left(Price_i\right) = {} & \alpha_0 + \alpha_Z \widetilde{LSize_i} + \alpha_{YR} \widetilde{SYear}_i + \alpha_{AG} \widetilde{Age_i} + \alpha_{LA} \widetilde{LArea_i} + \alpha_{Ad} \widetilde{AdArea_i} \\ & + \alpha_{AC} AirC_i + \alpha_{Bt} \widetilde{Baths_i} + \alpha_{Dk} \widetilde{Decks_i} + \alpha_{Fr} \widetilde{Fire_i} + \alpha_{AG} \widetilde{AttG_i} + \alpha_{DG} \widetilde{DetG_i} \\ & + \alpha_{Tw} \widetilde{DistTown_i} + \alpha_{HS} \widetilde{DistHS_i} + \alpha_{PD} \widetilde{PDens_i} + \alpha_{MI} \widetilde{MedInc_i} \\ & + \left[\beta_0 + \beta_Z \ln\left(\widetilde{Size1_i}\right) + \beta_N \widetilde{NW1}_i + \beta_S \widetilde{SO1}_i\right] \ln\left(DI_i\right) \\ & + \left[\delta_0 + \delta_Z \ln\left(\widetilde{Size3_i}\right) + \delta_N \widetilde{NW3}_i + \delta_S \widetilde{SO3}_i\right] \widetilde{Mile3_i} \\ & + \gamma \widetilde{Mile10_i}\end{aligned} \tag{7}$$

where the tildes above each variable indicate that they are measured relative to the mean in the sample.[22]

There are a number of hypotheses of interest in terms of the hedonic price function. Specifically, we consider the following four hypotheses:

- $H_0^A : \beta = \delta = \gamma = 0$. This hypothesis corresponds to a test as to whether the livestock facilities have any effect on rural residential property values.
- $H_0^B : \delta = 0$. This hypothesis corresponds to a test as to whether concentration of livestock facilities in the region has any effect on rural residential property values, over and above the impact of the nearest facility.
- $H_0^C : \delta = \gamma = 0$. This hypothesis corresponds to a test as to whether only the nearest livestock facility affects a property.
- $H_0^D : \beta_k = \delta_k = 0 \forall\, k \neq 0$. This hypothesis corresponds to a test as to whether the characteristics of the livestock facilities (i.e., size and wind direction) have any effect on rural residential property values.

Results

Table 4 provides the results of estimating the hedonic price equation in (7). Coefficient estimates are presented for the unconstrained model and under each of the hypotheses outlined in the previous section.

All of the structural characteristics of the home have the expected signs and are statistically different from 0 at the 1 percent level or better. For example, each year of age of the home reduces its value by roughly 0.4 percent, while a deck increases the home value by 5 percent, and each fireplace increases the value by 8 percent. Moreover, the coefficients change little across the various model specifications. Likewise, the location variables, with the exception of distance to high school, have the expected size and signs. Each mile away from the nearest large town diminishes the property value by approximately 0.7 percent, whereas homes in areas with greater population densities and/or higher median income levels are generally more valuable. The only unusual result among the non-livestock factors is the coefficient on the distance to the nearest high school. In general, one would expect that this coefficient would be negative, indicating that easy access to the education system would increase the value of a home. However, under all the model specifications considered, the coefficient on *DistHS* is positive and significant at a 5 percent level or higher.

TABLE 4. Parameter estimates

Variable	Unconstrained	$H_0^A : \beta = \delta = \gamma = 0$	$H_0^B : \delta = 0$	$H_0^C : \delta = \gamma = 0$	$H_0^D : \beta_k = \delta_k = 0$ $\forall\, k \neq 0$
Intercept	11.07***	11.11***	11.08***	11.11***	11.08***
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
LSize	0.059***	0.061***	0.059***	0.062***	0.058***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
SYear	0.059***	0.059***	0.059***	0.059***	0.058***
	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Age	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
LArea	0.00029***	0.00028***	0.00029***	0.00028***	0.00030***
	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00003)
AdArea	0.00034***	0.00035***	0.00034***	0.00034***	0.00035***
	(0.00005)	(0.00005)	(0.00005)	(0.00005)	(0.00005)
AirC	0.31***	0.31***	0.31***	0.31***	0.31***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Baths	0.17***	0.18***	0.17***	0.18***	0.17***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Decks	0.046***	0.046***	0.044***	0.044***	0.046***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Fire	0.076***	0.081***	0.077***	0.076***	0.084***
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
AttG	0.16***	0.17***	0.16***	0.16***	0.16***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
DetG	0.09***	0.10***	0.09***	0.09***	0.09***
	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)
DistTown	-0.0065**	-0.0070***	-0.0068***	-0.0066***	-0.0070***
	(0.0025)	(0.0025)	(0.0026)	(0.0026)	(0.0025)
DistHS	0.0036**	0.0030**	0.0035**	0.0026*	0.0040**
	(0.0016)	(0.0016)	(0.0016)	(0.0016)	(0.0016)
PDens	0.0011**	0.0013**	0.0012**	0.0014***	0.0012**
	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)
MedInc	0.015***	0.013***	0.014***	0.013***	0.014***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)

TABLE 4. Continued

Variable	Unconstrained	$H_0^A : \beta = \delta = \gamma = 0$	$H_0^B : \delta = 0$	$H_0^C : \delta = \gamma = 0$	$H_0^D : \beta_k = \delta_k = 0$ $\forall\, k \neq 0$
LN(DI1)	-0.009		-0.011	-0.038*	0.029
	(0.029)		(0.026)	(0.021)	(0.025)
*Size1*LN(DI1)*	-0.064		-0.086**	-0.075*	
	(0.042)		(0.040)	(0.040)	
*NW1*LN(DI1)*	0.052*		0.045	0.047	
	(0.029)		(0.029)	(0.029)	
*SO1*LN(DI1)*	0.036		0.031	0.033	
	(0.029)		(0.029)	(0.029)	
Mile3	0.0010				0.0080
	(0.0079)				(0.0066)
*Size3*Mile3*	-0.0060				
	(0.0169)				
*NW3*Mile3*	0.00043*				
	(0.00025)				
*SO3*Mile3*	0.00027				
	(0.00022)				
Mile10	0.0015		0.0018**		0.0011
	(0.0009)		(0.0008)		(0.0009)
LogLik	-638.9	-649.2	-641.3	-644.3	-645.5
χ^2		20.6***	4.8	10.8*	13.2**
Df		9	4	5	6
P-value		0.01	0.31	0.06	0.04

*Statistically different from zero at a 10% level. **Statistically different from zero at a 5% level. ***Statistically different from zero at a 1%level.

Turning to the livestock proximity factors, the unconstrained model in column 2 of Table 4 indicates that few of these coefficients are individually significant. The exceptions are the two wind direction variables associated with the winter season. Specifically, the coefficient on the interaction term *NW1*ln(DI1)* is positive and statistically significant at a 10 percent level. This indicates that for homes downwind of a livestock facility during the winter season, an increase in the distance to the facility is associated with a higher property value (i.e., proximity to the livestock facility is a disamenity). While a similar point estimate applies to the summer wind direction variable, it is not statistically significant. On the other hand, the coefficient on the interaction term *NW3*Mile3* is positive and significant at a 10 percent level, indicating that a higher number of facilities in the region is generally associated with higher property values. This may be capturing the positive impact of economic activity in the region on property values.

While the livestock factors are not measured precisely on an individual basis, it is apparent that they are significant as a group. In column 3 of Table 4, the hedonic price coefficient estimates are presented under the hypothesis that all of the livestock factors are 0. The associate likelihood ratio test statistic ($\chi^2_{df=9}$=20.6) clearly rejects this hypothesis with a p-value of 0.01. Livestock facilities apparently do have a significant effect on rural residential property values in Iowa.

The lack of individual coefficient significance for the livestock variables may be due in part to the high degree of correlation among some of the explanatory variables. In particular, for many housing units the closest livestock facility is also the only livestock facility within a 3-mile radius, resulting in substantial correlation among the *ln(DI1)* and *Mile3* variables. Column 4 of Table 4 considers a simpler specification for the livestock variables, restricting the *Mile3* factors all to 0. This hypothesis is not rejected at any reasonable level. However, restricting both the *Mile3* and *Mile10* factors to be 0, as in column 5, is clearly rejected. Finally, ignoring the size and wind direction characteristics of the surrounding livestock facilities (as in the model presented in column 6) is also rejected as a restriction.

To illustrate the implications of the livestock factors for housing prices, Table 5 presents the price elasticity of housing with respect to the distance to the nearest livestock facility. Using equation (7), this elasticity is given by

$$\eta_{DI1} = \frac{\partial \ln\left(Price_i\right)}{\partial \ln\left(DI_i\right)} = \beta_0 + \beta_Z \ln\left(\widetilde{Size1}_i\right) + \beta_N \widetilde{NW1}_i + \beta_S \widetilde{SO1}_i \quad , \tag{8}$$

and depends on both the wind direction and size of the nearest operation. In Table 5, we calculate this elasticity for three sizes of operations (250,000; 450,000; and 650,000 live weight) and three wind direction scenarios (*NW1*=1, *SO1*=1, and *NW1*=*SO1*=0). In general, if the nearest livestock facility is a disamenity, one would expect the elasticity η_{DI1} to be positive, indicating that the value of the rural residential property increases as the distance to the nearest livestock facility increases.

Several patterns emerge in terms of the distance elasticities in Table 5. First, point estimates for these elasticities are largest if the nearest facility is upwind in the winter months (i.e., northwest) and smallest if the facility is downwind from the property (column 4). Second, while the distance elasticities are generally positive, as expected, they are statistically significant only in two cases: when the livestock facility is moderately sized (250,000) and when it is upwind of the home. While this finding first seems counterintuitive, the size of the facilities may be serving as a proxy for other

TABLE 5. Price elasticities

Size of nearest facility (live weight)	Wind direction		
	NW=1	***SO=1***	***NW1=SO1=0***
250,000	0.098***	0.085**	0.053
	(0.034)	(0.036)	(0.039)
450,000	0.044	0.031	-0.009
	(0.029)	(0.029)	(0.026)
650,000	0.024	0.011	-0.022
	(0.033)	(0.032)	(0.027)

** Statistically different from zero at a 5% level. *** Statistically different from zero at a 1% level.

unobserved attributes of the confinement unit, including its age and the type of storage system. In particular, most of the largest facilities in Iowa are relatively new and rely on liquid manure storage systems. Additional research, including information on the management and infrastructure of each livestock facility, is needed in order to disentangle the dependence of the distance elasticity on facility size.

Finally, consider a rural residential property that currently has no livestock facility located within a 3-mile radius. Tables 6a through 6c provide the predicted reductions in property value that would result from a new livestock facility locating at various distances away from a residence.[23] For example, Table 6a considers locating the new facility ¼ mile away from the home. The pattern of results, not surprisingly, is similar to that found for the distance elasticities reported in Table 5. The impact is largest if the new facility is located upwind of the home and is moderate in size (i.e., 250,000 pounds live weight). Moreover, the property value reductions are statistically significant at a 95 percent confidence level only for the upwind and the moderate-sized facilities. In these cases, the new facility would reduce the property value on average by 26 percent if located northwest of the home and 22 percent if located south. For the average-sized facility of 450,000 live weight, the percentage reductions are substantially smaller (less than one-half) and statistically insignificant in all cases. Locating the new facility ½ mile away from the residence (as in Table 6b) reduces the impact by 30 to 40 percent, but the pattern remains the same in terms of statistical significance and the influence of wind direction and size. Finally, locating the facility 1½ miles from the property (Table 6c) further reduces the impact, with the property value reduction now ranging from roughly 0 to 6 percent.

Conclusions

Iowa is an ideal place to raise livestock. The state has relatively few people, abundant land, its crop sector imports fertilizer, and it has the lowest-cost feed. Yet, currently it is quite difficult to build a new livestock feeding operation in Iowa because of the opposition of rural residents. The estimated effects of proximity to livestock feeding operations on property values in this study help explain the stalemate in siting new

TABLE 6A. Percentage reduction in property value from a new facility located ¼ mile away[a]

	Wind Direction		
Size of Facility (live weight)	***NW=1***	***SO=1***	***NW1=SO1=0***
250,000	26** (5,49)	22** (1,45)	13 (-6,34)
450,000	11 (-5,29)	7 (-7,24)	-1 (-13,13)
650,000	3 (-15,22)	-1 (-16,17)	-8 (-20,6)

Note: 95% confidence bounds in parentheses.

**Statistically different from zero at a 5% level.

TABLE 6B. Percentage reduction in property value from a new facility located ½ mile away

	Wind Direction		
Size of Facility (live weight)	***NW=1***	***SO=1***	***NW1=SO1=0***
250,000	18** (4,33)	15** (1,31)	9 (-4,24)
450,000	8 (-4,20)	5 (-5,17)	-1 (-9,9)
650,000	2 (-11,16)	0 (-12,12)	-6 (-15,5)

Note: 95% confidence bounds in parentheses.

**Statistically different from zero at a 5% level.

TABLE 6C. Percentage reduction in property value from a new facility located 1½ miles away

	Wind Direction		
Size of Facility (live weight)	***NW=1***	***SO=1***	***NW1=SO1=0***
250,000	6** (1,12)	6** (0,11)	3 (-2,9)
450,000	3 (-1,7)	2 (-2,6)	0 (-4,3)
650,000	1 (-4,6)	-1 (-16,17)	-2 (-6,2)

Note: 95% confidence bounds in parentheses.

**Statistically different from zero at a 5% level.

operations in Iowa. The results suggest that there may be approximately a 10 percent drop in property value if a new livestock feeding operation is located upwind and near a residence. This drop in value helps explain opposition by rural residents to large-scale feeding operations. Livestock supporters often admit there could be circumstances whereby livestock facilities might affect property values, but they argue that the costs are worth bearing because of the need to support a competitive industry in the state. From their perspective, a 10 percent drop in the price of a $100,000 home is not large when compared to investment costs of more than $300,000 for a new operation. The siting stalemate reflects the political stalemate in Iowa. The state's political leaders do not seem to be able to resolve the problem because of the conflicting interests of important political constituents.

This is a classic problem in which a production externality cannot be internalized because of a lack of property rights. If rural residents were granted the right to be free of damage, then our estimate of the magnitude of the effects of livestock facilities on property values suggests room for mutually beneficial trading. If the willingness to pay to site a feeding operation in Iowa exceeds the willingness to accept the damage caused by the facility, then one would expect private negotiations to result in an agreement whereby livestock operators would pay residents for the right to locate their feeding operations nearby.

The results suggest that the magnitude of the payments that would have to be made would be relatively modest if operators followed common sense siting rules. For example, we cannot reject the hypothesis that siting a facility out of the path of prevailing winds causes no damage. And the results are consistent with the expected finding that the greater the distance between the facility and the residence, the less the damage. Thus, if an operator would negotiate with residents located within a mile or so of a proposed site, the site were located no closer than ½ mile of a resident, and no residence was located downwind of the site, then we would expect the required payments to obtain the acquiescence of the residents to be relatively modest.

Of course, our point estimates are only our best prediction of the average damages. Actual damages depend on unmodeled effects such as local topographic features, site-specific management practices, the type of manure storage and land application

techniques used, and other factors. Agreements between livestock feeders and rural residents would have to include good faith provisions in which operators followed prescribed management practices that are shown to reduce damage and subsequently residents agreed to allow the feeding facility to remain in operation.

More precise estimates of the effects of feeding operations on property values could be obtained by gathering more data about the attributes of the operations. In particular, our finding that proximity to moderate-sized operations (250,000 pounds live weight) results in greater damage to property values than proximity to large operations likely is a result of different management practices employed at smaller units. Greater knowledge of the management practices used on the various-sized units would allow us to better estimate the effects of size on damage.

Endnotes

1. As Palmquist, Roka, and Vukina (1997) note, similar trends toward industry concentration have emerged in North Carolina, the second largest pork producer in the nation. By 1993, 13 percent of the producers were responsible for 95 percent of the state's total swine production (Hurt and Zering 1993).

2. For the text of the bill, see <http://www.legis.state.ia.us/GA/79GA/Legislation/SF/02200/SF02293/Current.html>.

3. The case, heard by a Sac County jury, was *Blass et al.* vs. *Iowa Select Farms, Inc*.

4. Construction permits were also required for confinement feeding operations that used earthen storage and had an animal weight capacity of 200,000 pounds or more (400,000 or more pounds for bovine).

5. Freeman (2003, chap. 11) and Palmquist (1991) provide more complete overviews of theory underlying hedonic pricing analysis.

6. Farber (1998) provides a summary of recent studies of the impact of LULUs on property values.

7. Specifically, the house variables were the square footage, the age of the house, the number of bedrooms and bathrooms, and the assessor's estimate of the ratio of house value to property value.

8. Wright County was originally included in our study area but eventually was dropped because of problems in obtaining residential sales data for the county.

9. Specifically, among the counties with a high density of livestock operations, Franklin has over 36 percent of moderate-sized facilities, Hamilton has 22 percent, and Hardin has 29 percent.

10. In order to properly account for proximity to animal operations for rural residential properties that were close to the county boundaries, we added a 10-mile buffer around the study area and included livestock facilities found in the buffer. The averages in Table 1 include facilities in the five-county study area (349) and the buffer zone (201).

11. There are two limitations to the livestock facilities data available for our analysis. First, we have information on only those operations in the five-county study area that are sufficiently large to require a manure management plan and/or a construc-

tion permit. Thus, we are not able to control for the impact of smaller livestock operations on rural residential property values. However, we were able to obtain data on all of the livestock facilities for Franklin County. This additional information did not change qualitatively the regression results for Franklin County. Second, the IDNR data does not provide a time series on the size (i.e., live weight) of each of the livestock facilities. Instead, we assumed that the operation size and locations were those reported in the manure management plan or construction permit filing and were constant over the study period. This creates a potential measurement error problem, particularly for those housing sales during the early 1990s. However, sensitivity analysis, excluding homes sold prior to 1996, again did not change the nature of the results.

12. The largest operation in the data set corresponds to an egg laying operation.

13. Because each assessor's office had different filing systems, in some counties we were unable to obtain data for sales in the early 1990s.

14. DOQQs are available at <http://cairo.gis.iastate.edu/doqqs.html>.

15. Specifically, we used Sidwell's online maps (<http://www.sidwellmaps.com/>) for Franklin and Humboldt counties, and copies of the assessor's paper maps for Hamilton County. All data were analyzed in UTM Zone 15, NAD83.

16. We chose the 2,500 population cutoff in consultation with Daniel Otto, an Iowa State University Extension expert in economic and rural development. Towns over 2,500 were deemed large enough to serve as a hub of local economic activity, both in terms of employment and shopping.

17. It is worth noting that, according to Iowa law, operations built after January 1, 1999, have to comply with regulations on minimum distance to buildings and public use areas that range from 750 to 1,875 feet. Details about the regulation are available at the web site of the Iowa Department of Natural Resources, Water Quality Bureau.

18. The latter two wind direction variables were based on prevailing wind directions in Iowa (Mukhtar and Zhang 1995). Specifically, $SO1$=1 if the angle between the closest confinement and the house was between 135° and 255°, and $NW1$ = 1 if the angle between the closest confinement and the house was between 270° and 360°.

19. There are 458 properties that have no confinements within a 3-mile radius and 524 that have one to five operations within it. The remaining 163 properties have between 6 and 27 operations in the 3-mile radius.

20. Note that both the inverse distance and log distance ensure that the impact of a negative externality diminishes with distance.

21. The choice between the linear and logarithmic price specifications (i.e., Models 1 and 3 versus Models 2 and 4) was the most straightforward. Following PRV

(endnote 4), the sum of squared residuals from the two specifications were compared, after first normalizing observed prices by their geometric means. Palmquist and Danielson (1989) show that this is equivalent to using the Box-Cox criterion. The differences between using inverse distance and log-distances to the nearest site were less substantial, but the log-distance specification (i.e., Model 4) consistently dominated in terms of log-likelihood.

22. For example, $\widetilde{Age}_i \equiv Age_i - \overline{Age}_i$ where $\overline{Age}_i$ denotes the mean house age in the sample.

23. For the purposes of this exercise, we use the simpler hedonic price specification in column 4 of Table 4.

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Slaughterhouse plans draw out supporters, opponents

(/uploads/original/20200924-090021-Slaughterhouse.jpg)

Cody businessman Dave Peterson hopes to start a meat processing facility in this building, which sits in an industrial zone on North Street. Powell ordinances prohibit the slaughter of animals, but the council is considering a request to change the rules.

TRIBUNE PHOTO BY KEVIN KILLOUGH

Posted Thursday, October 8, 2020 8:20 am

By Kevin Killough (mailto:kevin@powelltribune.com)

The Powell City Council got an earful on Monday from opponents and supporters of a proposed meat processing facility in an industrial area on the south side of town. While those living near the proposed location are concerned about noise, smells and safety, supporters say it's going to bring an important benefit to agriculture.

Last month, Dave Peterson, owner of the Proud Cut Saloon in Cody, asked the Powell council to change city code to permit the slaughter of livestock within city limits; he also met with Mayor John Wetzel, Councilor Lesli Spencer and city staff for a Sept. 22 planning session to discuss details on the facility.

In last month's planning meeting, it was determined Peterson would need to come up with a mitigation plan for a number of impacts of the facility on sewer drainage and neighborhood noise and smells, said Powell Economic Partnership (PEP) Executive Director Rebekah Burns.

At Monday's meeting, the council took public comments on the requested change to the ordinance, but no action was taken.

Burns reiterated PEP's support for the facility, which Peterson hopes to house in an existing building on East North Street.

"Powell is an agricultural community. And that's something Powell should feel real pride about," Burns said.

Currently, beef producers are dependent on large processing facilities, like the JBS plant in Greeley, Colorado. Since those plants process hundreds of head per day, they can't process smaller producers' products separately, making it impossible to market Wyoming beef through the conglomerates, which control about 80% of all meat processing in the U.S. To market Wyoming beef, producers have to rely on smaller processors that don't currently have the capacity to meet demand. For example, Roger's Meat Processing — the only processor in the Powell area — is booked up through next April.

Val Murray, who raises cattle in the Willwood area at Murraymere Farms, spoke in support of the ordinance change. For years, Murray has been trying to market Wyoming beef to Taiwan, where it is served in high-end restaurants at a premium (though the COVID-19 pandemic brought that initiative to a halt).

Murraymere Farms, Murray said, is currently at the mercy of the large meat conglomerates, such as JBS, and have to ship cattle "a thousand miles away."

After the pandemic disrupted operations at large processing plants and meat supplies dried up at grocery stores, Murray said phones at the family farm were "ringing off the hook." With limited slaughter capacity at area facilities, however, there was only so much local producers could do to meet demand.

"This is an amazing opportunity to keep Wyoming beef in Wyoming," Murray said of Peterson's plan to build a slaughterhouse in Powell.

Rep. David Northrup, who also raises cattle on the Willwood, said he was "wholeheartedly" in favor of the project.

"It's about trying to get a business that produces a Wyoming product," Northrup said.

Opposition

However, some residents are adamantly opposed to the facility and any change in the city ordinance.

Though Peterson's request was first presented at a public council meeting last month, Jim Marquez, who lives within a block of where Peterson intends to operate the facility, said he was surprised the city didn't notify residents of the request. Instead, he had to learn about it from coverage in the Powell Tribune.

"It's a very bad idea to have that business right there," said Marquez.

He said if the facility opens, he'll be forced to move. He's lived in towns where processors operated, and he said these facilities attract flies and mosquitoes. He said his daughter, who goes to school in Torrington, told him the processing facilities in that area produce strong odors.

There is a single butcher shop in Torrington, and the total slaughtering capacity in all of Goshen County is about 780 head per year, according to a 2019 Wyoming Business Council report.

Mayor Wetzel said the odors in Torrington likely came from feedlots, which have numerous cattle in a pen for a much longer period than what will happen at Peterson's business. Wetzel recommended Marquez drive by Roger's Meat Processing, which is north of Powell. The mayor said he lives downwind from Roger's, which processes about 16 to 20 head per week, and he's not had any problems with odors.

Marquez said he's worked in large meat packing plants, which he insisted produce lots of odors, and he was unconvinced that Peterson's business wouldn't be a problem in that regard.

Opponents also expressed concern that the building was already being converted for use as a meat packing plant, suggesting the council had already approved it. Marquez claimed someone had broken up the interior concrete floor and poured new concrete at night. He also said four employees of the city did some digging in the area. When Marquez spoke to the workers, they told him that they were doing work on the sewer for the proposed plant.

Wetzel said the city hasn't made any decisions. He explained to Marquez that in order for the change in ordinance to go through, the city will need to print notices in the newspaper and vote on three readings of the new ordinance.

"We're a minimum of two months out before making a decision on this," the mayor said — and he assured the residents the council hasn't made up their minds about Peterson's request.

City Administrator Zack Thorington said he was unaware of any work on the sewers. He said it might have been exploratory work to prepare for future work.

"We are not telling anyone to do anything at this time," Thorington said.

Peterson explained it was likely work he requested from the current owners as part of the agreement to purchase the property, which included replacing broken concrete and repairing a drain that didn't work.

Other concerns

Tammy Howard, another resident in the neighborhood opposed to allowing the plant, also claimed the building had been modified. She said a cattle grate and sliding warehouse door had recently been installed.

However, City Clerk Tiffany Brando, who frequented the fitness center that previously occupied the building, said the door and grate were in there at that time and were not new additions to the building.

Marquez also asked why Peterson needed to locate the facility in the city limits, when there is lots of territory out in the county away from residents.

Peterson said federal and state regulations require a number of utility standards, potable water and other items, which would be difficult to satisfy where there are fewer services available.

Howard said she purchased her home in November and bought the house thinking the only business in the area was a fitness center. She said a slaughterhouse would diminish the value of her property.

"Who wants to buy a house next to a slaughterhouse?" Howard asked rhetorically.

She said the byproducts at the plant would attract flies and maggots. Wetzel explained that, according to mitigation plans Peterson is developing, the renderings would be kept in closed barrels in a climate-controlled room and shipped to landfills daily.

Burns pointed out that, as a USDA-inspected facility, it would have to adhere to health codes that would prohibit conditions that would attract flies and maggots.

"That could not be possible if they're going to sell the end product," Burns said.

Howard also argued the safety of kids riding bikes in the neighborhood would be put at risk by semi trucks bringing in cattle for slaughter.

Burns said that the number of head that would be processed at the facility was small enough that the animals would be brought in by horse trailers pulled by pickup trucks, and there would only be a few per week.

Noise was also a concern for the residents. Peterson explained that, unlike large packers that have thousands of cows in pens, his business would have 20 cows at most at the Powell facility, twice per week, and the slaughter process would be complete within a few hours of the cows' arrival. He also said the killing floor would be in the middle of the building, which would also help reduce the noise.

Bill Hodgkiss, who lives in the northern part of Powell, was critical of the plan to partner with Northwest College's agricultural department.

"If I was a parent, I would never send my kid to college to learn how to work in a slaughterhouse," Hodgkiss said.

However, Powell resident and Ward III council candidate Heath Streeter argued such a program would help improve enrollment rates at NWC, which have been in decline for years.

"I think it's a good thing for our community and our college," Streeter said.

Hodgkiss also wondered why Peterson wasn't opening the facility in Cody, where his restaurant is located and city code already permits processing plants.

"Why does he want to come over here to Powell and stink us up?" Hodgkiss asked.

Peterson explained that he wanted to not only partner with NWC, he also wanted to bring jobs to Powell.

Wetzel pointed out that the one question constituents always ask when someone runs for the council is what they do to create jobs and economic development in Powell.

"It's not, 'What are we going to do for economic development in Cody?'" Wetzel said.

Marquez argued that processors have a difficult time finding people willing to work at the facilities, so he doubted Peterson's business would create jobs anyone wants.

The discussion concluded with Wetzel saying the council would continue gathering details on the project and the mitigation plan so that they can begin making decisions in upcoming meetings.

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SEP 24

THURSDAY, SEPTEMBER 23, 2021

POWELL TRIBUNE

Blue Ribbon School

Powell Middle School recognized with national award

BY TESSA BAKER
Special to the Tribune

Powell Middle School has been named a National Blue Ribbon School, considered the highest honor an American school can achieve.

"Powell Middle School is one of only five middle schools in the nation to be recognized in the category of Exemplary High Performing, which is an astounding accomplishment," said Jay Curtis, superintendent of Park County School District 1. "This is truly a testament to not only the hard work of our staff and students, but of the culture of high expectations and support that pervades that school."

'In the history of Wyoming, very few secondary schools are selected for this award.'
Kyle Rohrer
Principal

The recognition is based on the school's overall academic performance.

Curtis said he "could not be more proud" of the middle school's Blue Ribbon recognition, adding, "achieving at that level is only possible when schools have incredible support from parents and community in the way that our schools do."

"This is truly a congratulations for the middle school and the community that supports it so well!" he said Wednesday.

The U.S. Department of Education officially announced the Blue Ribbon award on Tuesday. The honor is "the pinnacle of all recognitions or awards a school

See Award, Page 2

Frank Fagan, pitcher for the One Hit Wonders, gets ready to hit the ball in a losing effort against the Buds during a Saturday game in the loser's bracket of the Field of Dreams Softball Tournament. Heart Mountain was a target in the background.

Made for Dreams

Local farm family restarts rural charity softball tournament

BY MARK DAVIS
Tribune Staff Writer

As two final teams lined up along baselines for the National Anthem, emotions were running high. But there were technical issues and the recording wouldn't work. So organizers and players decided to sing acapella.

It was important the tradition be upheld and those in attendance at the Field of Dreams Softball Tournament honor America — especially this year.

The charity tournament, played on a manicured field of Garrison creeping fescue grass groomed specifically for the annual community event, was canceled in 2020 due to the pandemic. The competition is enjoyed by teams made up of farmers, ranchers, bakers and hardworking folk in the Powell area and it was lost last year. Returning this summer, the joy of being reunited was evident during the three-day celebration.

The ball field was modeled after Wrigley Field, in Chicago, in honor of June Johnson, who recently passed. She was a die-hard Cubs fan.

The Field of Dreams, built in the shadow of Heart Mountain, isn't outlined by brick and ivy. Instead, the background and outfield walls were made of more than 75 half-ton bales of hay, painted with ivy and distance markers and adorned with flags — the American flag in the middle.

The voices were weak at the nation's song began on Sunday. Yet the sound of the 30 or so players, dozens of spectators, vendors and organizers — struggling with the notes but moaning every word — was beautiful.

The singing of the Star Spangled Banner is often a formality before game time, but on this day it meant something deeper. Voices cracked and eyes glistened in the sun that finally broke through the clouds on a chilly morning. Tears welled and dripped down rosy cheeks. As the song ended, a hawk soared above the outfield, circling several times.

They were together again and absence had done its job, forcing the hearts of the players to feel stronger than in years past. There was hope for the future. And togetherness.

"This tournament improves communication in the community. It builds great friendships,"

See Softball, Page 8

Luke Anderson and Ann Kosorok fight for a fly ball on Saturday while playing for the Buds. They lost the game 6-5 to the eventual champions of the tournament, Two Balls, a Bat and a Ton of Enthusiasm.

HEALTHCARE PROVIDERS BEING STRETCHED BY COVID

NATIONAL GUARD ASSISTING HOSPITALS

BY CJ BAKER
Tribune Editor

Hospitals in northern Wyoming and southern Montana are being strained by the recent surge in cases of COVID-19, public health officials say, with it becoming harder to find available beds.

Park County Health Officer Dr. Aaron Billin, who is an emergency room doctor at Powell Valley Healthcare, said he was recently turned down when he attempted to send a patient to one of the Billings hospitals. It was the first time he'd heard the two facilities say no to such a transfer.

"They've never uttered those words in 20-years," Billin said.

Three weeks ago, the doctor said he had to call six hospitals in four states before finally finding an open bed in Idaho for a critically ill patient.

"I personally have kept patients in the ER in Powell many hours longer than I should have — after car accidents, heart attacks, pneumonia, decompensated congestive heart failure — because there is no hospital that will accept them," Billin told Park County commissioners at their Monday meeting. "And we've kept them all night and turned our ER into a little mini ICU so that patients can get care."

DR. AARON BILLIN

As of Wednesday, there were 199 confirmed and probable cases of COVID-19 in Park County that were considered to be active infections, down by four from a week earlier. However, the number of COVID hospitalizations in Park County rose back to the pandemic high of 17, with 10 patients being cared for at Cody Regional Health

See COVID, Page 2

Northwest College board grants president authority to manage COVID restrictions

BY KEVIN KILLOUGH
Tribune News Editor

The Northwest College Board of Trustees voted Monday to leave COVID-19 response measures in the hands of the college's administration, which would allow more nimble responses as the spread of the disease changes.

The college's incident command team developed a plan in March 2020, which followed guidelines by the Centers for Disease Control, Wyoming Department of Health and Park County Public Health. At the time, NWC switched to online instruction for most of its classes and required masks for anyone on campus.

In the spring 2021, the college moved to fewer restrictions, including restoring in-person instruction and lifting the mask mandate.

This summer, as vaccination rates plateaued and case rates increased, the incident command team began reevaluating whether or not tighter restrictions needed to be implemented. The team decided to maintain the relaxed restrictions, while allowing for what it calls "operational flexibility," so the restrictions could be increased or decreased as needed.

LISA WATSON

"The plan is the plan. And the thing about plans is sometimes you need to be able to change them," NWC Interim President Lisa Watson explained at this month's board meeting.

The college is not planning

See College, Page 3

'Stand strong'

PROTESTERS URGE NONCOMPLIANCE WITH COVID VACCINE MANDATES

BY CJ BAKER
Tribune Editor

Dozens of residents gathered in Cody on Saturday to rally against the mandatory COVID-19 vaccinations proposed by President Joe Biden's administration.

"This is all about control," said state Rep. Dan Laursen, R-Powell. "They want to see how far they can go in controlling all of us. So stand strong."

Laursen was one of three state lawmakers and several individuals who addressed the crowd of about 75 people at the State of Wyoming Veterans Memorial Park.

Sen. Tim French, R-Powell, called the upcoming federal mandate "a horrible thing," saying it stands to put workers in the terrible situation of choosing between getting a shot they don't want or losing their job. French said it appears the Legislature will convene for a special session next month after more details about Biden's plans are known.

"We will fight back," he said.

Rep. Rachel Rodriguez-Williams, R-Cody, also called on attendees to get involved.

"Personal choice, not public pressure, not coercion, must be the only factor involved in getting the COVID-19 vaccine," Williams said. "It's time to put on the armor of God. It's time to push back against the establishment in Cheyenne and demand that the chief executive of our state, be a leader and fight against this tyranny."

Brian Schroeder, the head of the Cody Christian school Veritas Academy, warned that the mandates are only the first step toward the creation of a two-tier society, where the unvaccinated are cut out of the economy and barred from public places.

"The next logical step, of course, has to be forced vaccinations under threat of fines,

See Protest, Page 5

Attendees at a Saturday rally against vaccine mandates and passports display signs while listening to a lineup of speakers at the State of Wyoming Veterans Memorial Park in Cody. About 75 people attended the event.

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SLAUGHTERHOUSE NEIGHBORS LONG FOR SILENCE OF THE GOATS

By **BILL WHITE, The Morning Call**
THE MORNING CALL

MAY 27, 2000

"You still wake up sometimes, don't you? Wake up in the dark, with the lambs screaming?" Dr. Hannibal Lecter, "Silence of the Lambs"

* *

Neighbors of the Y.B. Halal Meat Market in Bushkill Township know all about the screaming of the lambs -- or in their case, the screaming of the goats. The neighbors say hundreds of them arrive by truck every week, and the gruesome sounds of the animals' crowded captivity and ritual slaughter resonates through much of the week. In accordance with religious customs, the butchers hang the animals upside down and cut their throats so they'll bleed to death.

"It sounds like they're killing babies," says Barry Hoch, who lives next door.

"They scream all night when they bring them in," says neighbor Jaci Hendricks. "My son asked me the other day, 'Why is that baby crying, and why won't it stop?' "

You could argue that the screaming of the goats, disturbing though it may be, was the least of the problems at the Jacobsburg Road slaughterhouse owned by Basri Orman. Bushkill Township filed a civil suit earlier this year asserting blood-, offal- and manure-tainted runoff from the slaughterhouse posed a public health hazard. When it rained, the disgusting mixture was running off across neighboring properties and into nearby waterways, the suit charged. What's more, odors from the business' huge pile of manure combined with animal slaughter by-products to create an ungodly stench.

This is not exactly your ideal neighbor.

"The defendant's activities are knowing and voluntary and a result of gross indifference to the public's sensitivities and right to live in a healthy and safe environment," the suit said.

The township and the slaughterhouse resolved that suit last week with Orman's agreement to remove all exposed manure piles and build a state Department of Environmental Protection-approved shed for storing the manure; install a proper holding tank for blood and offal; and redirect rainwater so it doesn't cause the tank to

to, it should take care of the worst environmental the hearing that these were the top priorities.

Now the township will have to decide how aggressive it will be about the noise complaints and the neighbor's allegations that buildings were erected on the slaughterhouse without permits or proper setbacks.

Asteak said a key issue in the noise dispute is whether the slaughterhouse has substantially increased the number of animals it's bringing in to kill. Because the butcher shop predates the zoning ordinance, the original use is permitted in a residential area.

Township zoning officer Tara Young, who has been on the job for less than a year, said it's her understanding that the use has increased substantially. "It used to be more like a country butcher shop," she said. "Now it's more like an all-out slaughterhouse. I think it sort of escalated to that without anyone knowing it."

She told me that to her knowledge, no permits were obtained for some of the buildings that have been erected.

I left messages for Orman at the meat market, but he didn't call me back.

After last week's court hearing, I went out there in the rain Monday and got a small taste of the situation, although the slaughterhouse had its doors closed, which I was told kept the noise at more acceptable levels than usual. Hoch and I stood in his yard and listened as goats were hoisted for slaughter. "They're taking them up," he said as we heard the sounds of dragging chains and the goats protesting. "Hear them screaming? Sounds like babies, doesn't it?"

It is unsettling, but as a meat-eater, I'm uncomfortable with criticizing anyone for slaughtering animals for food. Somebody has to do it, and I don't know that it can be done silently. Most of us don't think about how that lamb chop got to be a lamb chop.

Still, when the slaughterhouse stands in the middle of a residential area, its operators have a special responsibility to operate in a manner that's sensitive to the environment and their neighbors. It's certainly not encouraging to know that court action was required just to get them to take rudimentary steps not to flood their neighbors and local streams with manure and goat guts. Frankly, my dear, they don't seem to give a damn.

So now that the township appears to have the most disgusting environmental threat under control, it needs to take an aggressive approach toward addressing the neighbors' complaints about noise and unpermitted structures. Orman and company haven't earned themselves any slack.

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Noise assessment in slaughterhouses by means of a smartphone app

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Contributions: BTCG conception, study-design and coordination of the experiment, CMG data collection, SB, LG and MC analysis and interpretation of data; MFI and PS coordinating the experiment and drafting the article.

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Abstract

Regulation (EC) No. 1099/2009 on the protection of animals at the time of killing establishes an obligation to spare animals any avoidable suffering or stress prior to their slaughter. Although it has been pointed out that stressors also include noise, which can cause suffering and affect the quality of the meat, current legislation does not set a limit for environmental noise in slaughterhouses. This study was conducted in three slaughterhouses in central Italy to assess the environmental acoustic level using a smartphone app. The selected, medium-sized slaughterhouses for pigs and cattle were subjected to measurements using a sound-level meter (Noise Meter for iOS) during working hours at the unloading area and lairage, along the chute to the restraining pen, at the time of stunning and at the slaughter hall. For the bovine lines the average values expressed in dB ranged from 76.33 (SD 2.08) to 93.00 (SD 2.14) for abattoir 1, from 75.00 (SD 1.87) to 92.33 (SD 4.89) for abattoir 2 and from 75.67 (SD 7.09) to

88.83 (SD 4.79) for abattoir 3. For the pig lines the average values expressed in dB ranged from 77.50 (SD 3.11) to 100.33 (SD 1.53) for abattoir 1, from 83.00 (SD 2.00) to 99.75 (SD 2.63) for abattoir 2 and from 71.20 (SD 6.49) to 99.50 (SD 1.31) for abattoir 3. Data show that the pig slaughter line was always noisier than the cattle line and the slaughter hall always showed the highest values *(i.e.* 100 dB), when compared to the unloading area (*i.e.* 79 dB).

Key words: Noise assessment, Abattoir, Animal protection, Decibel

Introduction

Audition is the act of hearing a sound in response to acoustic waves or mechanical vibrations acting on a body and the *auditory stimuli* are the physical stimuli that are a source of sound (Scharine *et al.*, 2009). The response to auditory stimuli is called *auditory sensation* and depends on the characteristics of the sound itself (intensity, duration, frequency) while the *auditory perception* involve previous experience and interpretation of the sound (Scharine *et al.*, 2009). Sound frequency is expressed in Hertz: human frequency hearing ranges from 20 Hz to 20 000Hz, cattle hearing ranges from 25 Hz to 35 000 Hz and pigs from 42 Hz to 40 500 Hz (Heffner, 1998, Weeks *et al.*, 2009). Everything that exceeds the limits of agreeable sound is defined as *noise*, that is to say an unpleasant experience for human beings and animals, which can result in a physiological response to adapt to it; it is a non-specific stressor that excites the endocrine system and auto-nomic nervous system (Brouček, 2014; Manci *et al.*, 1988; Münzel et al., 2017). An increase in noise intensity can lead to stress for both animals and operators subjected to it and scientific literature has described the sound exposures effect on many species in different environment such as zoos, animal shelter, lairages, farms, laboratories (Coppola *et al.*, 2006; Grandin, 2010; Heffner, 1998; Münzel *et al.*, 2017; Orban *et al.*, 2017; Weeks, 2008). The sound intensity is measured in Decibels, which is a logarithmic scale, meaning that 80 dB is 10 times the intensity of 70 dB. To give an example, 80 dB is comparable to the noise of a vacuum cleaner at 1 meter, 90 dB is the noise of a heavy track at 1 meter (Heffner, 1998). It is recommended to use ear protection when the sound level is above 80 dB and for many decades it has been described that noise can affect human and animals (Wei, 1969).

The silence of the abattoir (Tesei, 2017) may appear to be an oxymoron. However, it constitutes the objective and proof of the optimum application of the correct abattoir management procedures.

Regulation (EC) No. 1099/2009 *on the protection of animals at the time of killing* clearly establishes the importance of sparing any form of avoidable stress, including also acoustic stress for which, however, no tolerance limits have actually been set. The main sources of stressful noise at the abattoir were identified as the operators' shouting, the metallic noise of slamming the gates and particularly noisy instruments (Berg 2012; Weeks 2008). After the transport, the animals find their arrival at the abattoir to be extremely stressful. Unloading is a delicate operation, which requires adequately trained staff to avoid the use of coercive means and the onset of phenomena of acute stress, with evident repercussions of the quality of the meat (Goumon and Faucinato, 2017; Grandin, 2001). Higher noise levels during unloading and in the lairage affect negatively meat quality (Van De Perre, 2011). After unloading, the animal is channelled into the pen in the lairage, where it will be able to recover before being sent along the chute to the stunning pen, where the processes of stunning and sticking take place (Warriss, 2003). Abattoir lairage in fact should represent a quiet place to make animal recover and rest after the transport (Weeks *et al.*, 2009).

Previous studies assessing noise at lairages have shown that vocalisation of cattle and pigs is usually not loud, whereas gates and slammed gates produced a high sound level. In addition, lairages are designed to be easy to clean, with surfaces which reflect, rather than absorb the echo (Weeks *et al.*, 2009). A noisy environment can make all the operations more complex and increase the animals' reluctance (Berg, 2012; Grandin, 2006).

Several tools are used to assess the protection of the animals during slaughtering (checklist, questionnaires, scores) and a visual inspection can reveal the causes of reluctance to move forward, including high environmental sound level (Grandin, 2012; Velarde and Dalmau, 2012). Animal protection is an ethical and regulatory prerequisite and if, on the one hand, consumer awareness has increased, on the other hand, the need for adequate training for the operators has become essential (Sechi *et al.*, 2015). We should consider not only the strictly ethical aspect, but also the detrimental effects that conditions of acute and chronic stress have on products of animal origin due to noise-induced cortisol (Van De Perre, 2011). To be precise, it has been highlighted how acoustic stimuli over 85 dB give rise to PSE (pale soft exudative) carcass quality meat in pigs (Vermeulen *et al.*, 2015). According to Weeks *et al.*, (2009) 80 dB is considered as an arbitrary limit for animal exposure, since this value is defined as the threshold level for human ear protection for continual exposure. Sound level meters are useful tool but can be very expensive and require specific knowledge to handle them. Nowadays, sound level meter can be provided by mobile technology with accessible information and can represent a low cost alternative. Since many apps are available for smartphone, accuracy of data based on sound level meter application for the iOS devices, has been compared by several authors. Many researches has been conducted in the recent years evaluating smartphone sound measurements applications (Kardous and Shaw, 2014; Murphy and King, 2016) concluding that certain app can be appropriately used for noise environmental evaluation and that application written for the iOS platform are more precise than those for Android or Windows platforms. In an attempt to evaluate the noise level in three slaughterhouses for cattle and pigs, this paper describes the results of a survey of the levels of sound intensity measured with a smartphone app.

Materials and Methods

Local Authorities provided a list of abattoirs and from this, a selection was made on the basis of species, throughput, building type and year of construction. Three abattoirs of medium capacity, slaughtering cattle and pigs were selected.

Abattoir 1 slaughters approx. 10,000 cattle and 50,000 pigs per year. The sectors set up for cattle slaughter have eight lairages with cement flooring: five measuring 25 m^2 and three 15.6 m^2. The lairages are completely under cover inside the building. The chute is 16.5 m long and 0.8 m wide. The walkway is level up to the final metre before access to the stunning pen, where it slopes upwards. The stunning pen measures 2.3 m long and 1 metre wide. There is no dividing wall between the aforementioned sectors. There are ten lairages for the slaughter of pigs, all with cement flooring (two measuring 22 m^2, eight measuring 16 m^2). The chute is 19 m long and 0.5 m wide. The walkway is level up to the final stretch, where it slopes upwards with a 90° curve to the right as far as the entrance to the stunning pen, measuring 1.3 m in length and 0.5 m in width. Abattoir 2 slaughters approx. 2,000 cattle and 20,000 pigs per year. The sectors set up for cattle slaughter has a total of two lairages, each measuring 40 m^2, and the floors are made entirely of cement. The pens are completely covered outside the building. The chute is 14 m long and 1 m wide. The walkway is level up to the final metre before access to the stunning pen, where it slopes upwards. The stunning pen measures 2.3 m long and 0.85 metre wide. There is no dividing wall between the aforementioned sectors. The sectors for slaughtering pigs include a total of five lairages, each 6.7 m^2, which the animals access via an unloading area measuring 13.5 m^2 outside the building, but with protection against inclement weather and raised 0.6 m above ground level. The chute is 16 m long and 0.7 m wide. The floor is made entirely of cement. The walkway is level up to the final stretch, where it slopes upwards with a 90° curve to the right as far as the entrance to the stunning pen, measuring 1.3 m in length and 0.5 m in width.

Abattoir 3 slaughters approx. 6,000 cattle and 10,000 pigs per year. It has a total of seven lairages for cattle, five of which measure 4.9 m^2 and one measuring 15.9 m^2, all with a cement floor. The pens are located on ground level outside and have protection against inclement weather. The chute is 3.5 m long

and 0.9 m wide. The walkway slopes upwards all the way. The stunning pen measures 2.4 m long and 0.8 m wide. There are four lairages for pig slaughter, varying in size (16, 19, 21, 31 m^2). The animals access the various lairages via an unloading area, measuring 15 m^2. The pens have cement flooring and are located outside the building, with protection against inclement weather. The chute is 2.25 m long and 0.5 m wide. The walkway slopes upwards without any curves. The stunning pen measures 1.3 m long and 0.5 m wide. A wall divides the (external) lairages from the (internal) chute. The survey involved three visits per slaughterhouse per species to three commercial abattoirs of similar throughput and capacity, in Umbria, Italy, for a total of 18 visits. For each visit, 4 rounds of measurements (30 seconds each) every 40-45 minutes were conducted. The following sampling points were selected: i) unloading area (in front of the entrance of the abattoir, on the side of the truck, 3 meters far, data collected during the process of unloading), ii) lairage (in the centre of the lairage area while animal are present and the machineries are turned on), iii) handling to stunning pen (1 meter far from the pathway to pen, when the handling of the animal to be slaughtered started), iv) stunning (on the side of the stunning pen, close to the operator) v) slaughter hall (in the centre of the slaughter hall during the routine activities).

The timeframe of the investigation covered the working day during routine activities. Data collecting was always conducted by the same professional and with the same smartphone and the same app (Apple iPhone 6 running iOS 10.3.3 and Noise Meter app version 2.3) to minimize variability. Noise Meter is used to measure sound level of surroundings and allows real time data recording, customize duration along with measurement frequency and location information. Noise Meter app was set to record maximum, minimum and average dB values for 30 seconds per sampling point. All measurements were done pointing the microphone towards the area of investigation. All data was exported in .csv format for further processing. A professional sound level meter SVAN 945a (Svantek, Warszawa, Poland) was used for the app calibration. All Noise Meter measurements were in the range ±5%.

The data were statistically treated by analysis of variance (ANOVA): the means were compared by the Fishers Protected Least Significant Difference test at significance level of 0.05 using the Statistical software StatView, 5.0.1 (SAS) for Mac OS 9.

Results

Table 1 summarises the values for sound intensity in the three abattoirs, divided by species and sampling points. Noise levels expressed in dB in abattoir 1 ranged from 77.19 (SD 11.283) to 104.65 (SD 4.40), in abattoir 2 from 74.45 (SD 9.81) to 104.69 (SD 3.71) and in abattoir 3 from 69.31 (SD 14.27) to 103.00 (SD 5.35). In particular in the bovine slaughter lines no statistical differences were detected at unloading, lairage, handling to stunning pen and stunning while the slaughter hall in abattoir 3 was statistically significant quieter than abattoir 1 and 2 ($P<0.005$). In the pig slaughter lines lairage in abattoir 2 was noisier than in abattoir 3 and 1 ($P<0.005$), while lairage in abattoir 1 was noisier than in 3 (>6.3 dB). Handling to the stunning pen in abattoir 1 was statistically significant ($P<0.005$). Regarding handling to stunning pen, the lowest values were recorded in abattoir 1 ($P<0.005$). At the stunning statistically significant differences were observed between abattoir 2 and the other two, abattoir 2 being the quieter. The higher peak level was recorded at the pig slaughter line for stunning (109,00 dB, SD 0.71) and the lowest peak level was recorded during the unloading of bovines of abattoir 1 (54.67, SD 3.51).

Table 1.

Average values expressed in dB in three abattoirs in Central Italy.

Abattoir	Species	Step	Average sound level (dB)	SD	Max sound level (dB)	SD	Min sound level (dB)	SD
1			89.26	7.75	104.65	4.40	77.19	11.28
	Bovine	Unloading	76.33	2.08	102.67	5.13	54.67	3.51
		Lairage	79.00	1.41	101.50	2.12	65.50	2.12
		Handling to stunning pen	88.33	2.94	106.67	1.97	72.50	5.86
		Stunning	93.00	2.14	106.63	1.69	80.13	4.82
		Slaughter hall	89.50	1.98	104.50	2.59	81.50	1.38
	Swine	Unloading	83.00	1.41	103.00	1.41	64.50	3.54
		Lairage	77.50	3.11	95.75	6.50	66.25	6.08
		Handling to stunning pen	91.50	2.38	104.00	2.71	82.50	2.38
		Stunning	99.40	0.89	109.00	0.71	89.60	1.95
		Slaughter hall	100.33	1.53	106.33	1.53	95.67	1.16
2			89.74	7.70	104.69	3.71	74.45	9.81
	Bovine							
		Unloading	75.67	1.53	92.00	7.00	60.67	3.79
		Lairage	75.00	1.87	100.60	1.95	56.60	2.30
		Handling to stunning pen	89.33	5.92	106.17	3.82	76.67	7.79
		Stunning	92.33	4.89	105.58	2.23	76.42	8.02
		Slaughter hall	89.89	3.06	103.00	1.94	75.67	6.04
	Swine							
		Unloading	83.00	2.00	103.40	2.41	63.60	4.83
		Lairage	83.40	9.10	101.40	8.33	68.20	4.92
		Handling to stunning pen	97.17	2.32	106.83	1.17	83.17	4.92
		Stunning	93.83	2.32	107.33	0.82	78.00	4.65
		Slaughter hall	99.75	2.63	107.25	1.71	87.75	3.78

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In general louder sounds were recorded in pig slaughter line compared to the bovine one.

Discussion

On the basis of the results obtained, the average values in dB in the various stages show that the pig slaughter line appears to be constantly noisier than the cattle line. The two exceptions were the average measurements obtained in the lairage at abattoir 1 and abattoir 2, where the noise recorded for the cattle in the lairages was higher.

The unloading stages constantly have a higher sound level for pigs compared to that of cattle. In fact, we have to bear in mind not only the larger number of pigs unloaded simultaneously, but also the vocalisation this species of animal emits under conditions of stress. Van De Perre (2011) recordes values from 69 to 99 dB during unloading of pigs. In abattoir 2, however, there is greater sound intensity in the lairage of pigs, probably due to the fact that the lairage area for the pigs are adjacent to the chute and near the slaughter hall. This does not occur in the other two abattoirs, where the lairages are further away (in abattoir 1) or even outside the building with a clear dividing wall (in abattoir 3). Weeks *et al.*, (2009) measured the average noise value during the 24 hrs in 34 abattoirs in England and Wales and recorded values from 52 to 79 dB for cattle lairages and from 46 to 87 dB in pig lairages. Talling *et al.*, (1998) recorded average value of 76-86 dB in pig lairages. Moving on to the chute stage, the average noise levels show constantly higher values for pigs in all three abattoirs. The greatest difference in sound levels between cattle and pigs were detected in abattoir 2 and abattoir 3. Average noise levels obtained in the chute for pigs in abattoir 2 (97.1 dB) and abattoir 3 (98.4 dB) were much higher than those in abattoir 1 (91.5 dB). This could be due to the fact that the pig chute in abattoir 2 is 70 cm wide (while the chutes at the other slaughterhouses measure 50 cm), which frequently enables the animals to move on top of each other as they go forward, resulting in additional stress and vocalisation. Whereas the dividing wall between the chute and the lairages in abattoir 3 is a positive factor for noise at the lairage stage, it probably turns into a negative factor as they advance, as it prevents sound dispersion. The sound levels recorded for the pigs during the stunning stage were also higher compared to those of the cattle. This is due to the very close proximity of the stunning pen, the sticking facility and the machinery used for the initial processing of the pig carcasses. Weeks *et al.*, (2009) measured the average noise value of 34 abattoirs in England and Wales during handling (80 to 90 db), while Van De Perre (2011) recorded levels of 84-95 dB during the movement to the stunner.

A comparison of the sound levels recorded during stunning in the three abattoirs showed that the average sound level in abattoir 2 during that particular stage is much lower compared to the average values of abattoir 1 (99.40 dB) and abattoir 3 (99.50 dB), even though the average noise levels measured at abattoir 2 during unloading, lairage and the chute are higher than or very similar to those of the other two abattoirs. In the processing area, the average noise levels are clearly far higher in the pig slaughter line, as a result of the structural proximity of the stunning pen and sticking facility and the machinery for the initial processing of the pig carcasses. There were no differences between the processing areas of the slaughterhouses as regards pigs.

Details of the cattle slaughter line showed the average values obtained for the unloading, lairage and the chute stages were basically similar in all three structures under examination.

In abattoir 3, the average noise levels in the stunning pen and in the slaughter hall were far lower compared to the other two slaughterhouses. In fact, the average noise values for the bovine slaughter line of abattoir 3 were 88.83 dB during stunning and 83.00 dB for the slaughter hall, whereas in abattoir 1 they were 93.00 dB during stunning and 89.50 dB for the slaughter hall and at abattoir 2 they were 92.33 dB during stunning and 89.89 dB in the slaughter hall. We should also take into account that the cattle stunning pen at the latter slaughterhouse lies close to the external area (where the lairages are to be found) and this could create a greater dispersion of sound. The noise effect regards animals to be slaughtered and it is associated to a condition of stress before slaughtering but also for the employers who rarely use hearing protections (Coppola *et al.*, 2006).

Conclusions

This study focuses its attention on one particular aspect, which can contribute to achieve more effective animal protection and a possible improvement of the European law to ensure compliance with the noise limits, in fact it is important to address any stress-inducing stimuli that can be reduced or eliminated. Without regulation on noise level, noise will be completely operator-dependent with higher risk of reduced protection of the animals. As suggested by Van de Perre (2011), building slaughterhouses with sound isolation or reflective materials or with a *decibel alarm*could prevent losses in meat quality.

The different layout of the lairage areas, the animals/hours and trained personnel all influence the environmental noise level. The abattoirs carried out similar activities and data was compared according to the species in the same abattoir and between abattoirs. All three slaughterhouses revealed that the noisiest part is the slaughter hall, where all the machinery stands, and the pig line is noisier compared to the cattle line. By comparison, the abattoir with the lairage area physically separated from the remaining areas is the least noisy. Each species showed substantial differences. In general, the sounds were louder in the case of pig slaughtering, with a peak value of 109.00 dB at the stunning area of abattoir 1. Recordings over 80 dB were very common during morning activities, when the abattoirs were busy and people are advised to wear ear defenders when exposed to levels above 80 dB. Our conclusions, therefore, highlight that in all the abattoirs visited, the noise levels recorded during working hours are high, especially during the chute and stunning stages, which actually require the handling of the animals. Structural interventions to reduce the noise levels do not appear easy to implement in the buildings we visited. However, these, together with the materials and machinery, should be taken into consideration, if new abattoirs are to be constructed.

Adequate training for staff in charge of slaughter is of fundamental importance, as the correct practices of handling and management of the animals enables the general noise level and the correlated stress of the animals to be contained. Lastly, we must remember that the sound levels recorded are also potentially harmful for man. In this specific sector regarding animal slaughter, as in other work sectors, investigations into environmental noise is essential, in order to opportunely prevent occupational illnesses linked to acoustic pollution in the workplace. As a result, our remarks obtained by a smartphone application were able to describe and compare the sound levels during the operational stages of three slaughterhouses and could serve to improve protection of animal and human health from noise-induced stress.

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Slaughterhouses and Increased Crime Rates

An Empirical Analysis of the Spillover From "The Jungle" Into the Surrounding Community

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More than 100 years after Upton Sinclair denounced the massive slaughterhouse complex in Chicago as a "jungle," qualitative case study research has documented numerous negative effects of slaughterhouses on workers and communities. Of the social problems observed in these communities, the increases in crime have been particularly dramatic. These increases have been theorized as being linked to the demographic characteristics of the workers, social disorganization in the communities, and increased unemployment rates. But these explanations have not been empirically tested, and no research has addressed the possibility of a link between the increased crime rates and the violent work that takes place in the meatpacking industry. This study uses panel analysis of 1994-2002 data on nonmetropolitan counties in states with "right-to-work" laws (a total of 581 counties) to analyze the effect of slaughterhouses on the surrounding communities using both ordinary least squares and negative binomial regression. The findings indicate that slaughterhouse employment increases total arrest rates, arrests for violent crimes, arrests for rape, and arrests for other sex offenses in comparison with other industries. This suggests the existence of a "Sinclair effect" unique to the violent workplace of the slaughterhouse, a factor that has not previously been examined in the sociology of violence.

Keywords: *meatpacking industry; slaughterhouses; crime; employment; rural communities*

At the turn of the 20th century, Upton Sinclair exposed the devastating work conditions and living environments of those who toiled in Chicago's stockyard slaughterhouses. In *The Jungle* he made a connection between the numerous after-work fights instigated by slaughterhouse workers and the killing and dismembering of animals all day at work:

> He [the police officer] has to be prompt—for these two-o'clock-in-the-morning fights, if they once get out of hand, are like a forest fire, and may mean the whole reserves at the station. The thing to do is to crack every fighting head that you can see, before there are so many fighting heads that you cannot crack any of them. There is but scant account kept of cracked heads in back of the [stock] yards, *for men who have to crack the heads of animals all day seem to get into the habit, and to practice on their friends, and even on their families, between times* (Sinclair, 1905/1946, pp. 18-19).

Although the "Sinclair hypothesis"—the propensity for violent crime is increased by work that involves the routine slaughter of other animals—has not been given much attention, geographers, sociologists, and anthropologists have begun to examine the community effects of the migration of slaughterhouses from urban areas to rural communities. As we will detail below, the framing of that work is solidly grounded in community sociology, where work on "boomtowns" resulting from a new industry coming to town has been a topic of research for at least three decades (see Berry, Krannich, & Greider, 1990; Camasso & Wilkinson, 1990; Freudenberg, 1981, 1984, 1986; Freudenberg & Jones, 1991; Hunter, Krannich, & Smith, 2002; Krannich, Berry, & Greider, 1989; Smith, Krannich, & Hunter, 2001; Wilkinson, Reynolds, Thompson, & Ostresh, 1984; Wilkinson, Thompson, Reynolds, & Ostresh, 1982). The application of the "boomtown" hypothesis and related theories to meatpacking communities undertheorizes the slaughterhouse in that it treats the work of killing animals as more or less the same as other assembly line work. We will demonstrate that a "sociology of the slaughterhouse," (York, 2004) which attends to the unique characteristics of this form of work, is needed.

A number of recent sociological studies have suggested that many social problems and phenomena cannot be adequately understood unless we examine the social role of nonhuman animals. For example, Arluke and Sanders (1996) and Irvine (2004) suggest that companion animals can play the role of the Median "other" in interactions. Fitzgerald (2005, 2007) and Flynn (2000a, 2000b) demonstrate the importance of companion animals in the dynamics of intimate partner violence. Jerolmack (2007) examines the importance of animals in constructing ethnicity and how some species become constructed as social problems (Jerolmack, 2008). Nibert (2002) and Winders and Nibert (2004) articulate the myriad ways the oppression of animals and humans are linked within the system of industrialized animal agriculture. Kalof (2007) documents the critical role animals have played in Western society for thousands of years. These and many other recent studies make that case that human interactions with nonhuman animals must be adequately theorized to understand a number of key social phenomena. Further, social organizations are frequently at the center of our most complex (and harmful) relations with animals (Gaines & Jermier, 2000). In particular, Rémy (2003) and Smith (2002) have demonstrated that the slaughterhouse occupies a contradictory position within society. Formal rules about requiring humane slaughter acknowledge that sentient creatures are being killed.[1] Yet those who are engaged in the work of the slaughterhouse also develop constructions that allow them to carry out this work. This contradiction does not occur when the subject of the industrial process is not an animal.

In this article, we test the argument—the Sinclair hypothesis—that suggests that the work of industrial animal slaughter with its inherent contradiction has a different effect on local communities than other forms of industrial work. We examine the relationship between slaughterhouse employment levels and crime rates, controlling for the variables commonly proposed in the literature as associated with crime in communities, and we compare the effects of the slaughterhouse industry with other manufacturing industries that are similar in labor force composition, injury and illness rates, but different in that the materials of production are inanimate objects, rather than animals. Our immediate goal is to examine the causes of crime in slaughterhouse communities, including the Sinclair hypothesis, and thereby contribute to the discussion of whether or not this social problem can be understood without taking account of "the animal Other" in human society.

The Community Effects of the Contemporary Slaughterhouse Industry

The production and slaughter of animals for human consumption has increased dramatically since the time of Sinclair's writing, facilitated by the "free" market and state policies (Winders & Nibert, 2004). This increase has been accompanied by drastic changes in the slaughterhouse or meatpacking industry—most notable in the past few decades—including corporate consolidation, the relocation of slaughterhouses to rural areas, a depression in wages, and the increased recruitment of immigrant workers (Stull & Broadway, 2004; Winders & Nibert, 2004). These changes have attracted the attention of scholars who have carefully documented three areas of impact: (a) influence on the physical environment and human health in communities where slaughterhouses have been sited, (b) physical impacts on the workers, and (c) social impacts in the communities. Our focus is on the latter category.

Ethnographic studies of communities where large slaughterhouses have been sited (such as Finney County, Kansas; Lexington, Nebraska; Perry and Storm Lake, Iowa; Guymon, Oklahoma; and Brooks, Alberta) have documented housing shortages (due to the influx of workers into the community), increased demand for social assistance (due to a number of factors, including the low wages paid by the industry, high injury and illness rates, and the high employee turnover rate), and an increase in crime (Broadway, 2000; Stull & Broadway, 2004). Of these social problems, increased crime rates have been the least readily explainable.

The slaughterhouse community studies have documented dramatic increases in crime that have outpaced increases in the population. Increases have been documented for violent crimes (Broadway, 2000; Grey, 1998b; Stull & Broadway, 2004), property crimes (Grey, 1995), and drug offenses (Horowitz & Miller, 1999). Most of the increases in violent crime rates have been attributed to increases in domestic violence and child abuse (Broadway, 1990, 2000, p. 40; Stull & Broadway, 2004, p. 103).

Crime Increases in Slaughterhouse Communities: Theory

The explanations proposed for the increase in crime rates in slaughterhouse communities have coalesced into three categories grounded in the sociology of community crime: explanations based on the demographic characteristics of the workforce, explanations based on population booms and social disorganization, and explanations that point to unemployment. These categories are certainly not mutually exclusive; rather, they represent three strains of thought that have developed rather distinctly in the literature on slaughterhouse communities and in slaughterhouse communities themselves.

Crime as a result of the demographic characteristics of the workforce. Much attention has been directed to the demographic profile of slaughterhouse employees. Whereas the general public, media, and even government officials have focused on the immigration status of slaughterhouse employees in relation to crime (discussed below), the academic literature has focused on the age, gender, and marital status of the workers as posing an increased criminogenic risk, with young single males most likely to seek employment in the meatpacking industry (Broadway, 1990, 1994, 2000, 2001; Broadway & Stull, 2006; Stull & Broadway, 2004).

It is, however, not clear that the bulk of those who move to slaughterhouse communities are single males. Immigration for work purposes generally involves the following process:

solo men are recruited or come to an area for work; later their families follow; and subsequently other immigrants might follow, using social networks with individuals already settled in the area to find employment (Dalla, Ellis, & Cramer, 2005; Martin, Taylor, & Fix, 1996). Although this pattern is characteristic of migrant farmer communities, the immigrants moving to slaughterhouse communities for work are usually not migrant farm workers, although this is not meant to imply that there is never crossover between these groups. The salient point here is that there are fewer solo males and more families in meatpacking towns than in migrant farm worker towns because unlike migrant farm work, slaughterhouse jobs offer year-round employment and enough money to make supporting a family more feasible (Martin et al., 1996).

The influx of immigrants into slaughterhouse communities has also been blamed for the increase in crime. The transition to the use of immigrant labor has been a profound and highly contested development in the meatpacking industry (Grey, 1998a). Immigrants who relocate to communities to work in slaughterhouses are often scapegoated by the general public, the media, government officials, and the meatpacking industry itself, in an attempt to explain away the resultant social disruption in communities where slaughterhouses have been sited. After a recent influx of slaughterhouses in Nebraska, a group of police officers and government officials contacted the Immigration and Naturalization Service (INS) Commissioner in Washington with concerns over the increased crime rates, which they attributed to the increase in immigrants in their communities (Bacon, 1999). In Buena Vista County, Iowa, an assumed link between immigration and crime became the central issue of the 1994 election for the county attorney position. The challenger to the 16-year incumbent made the slaughterhouse industry's hiring practices a central theme of his campaign and accused a slaughterhouse company of "social pollution" (Grey, 1998b). The challenger won the primary. Racial violence has erupted in some locations. For example, there have been reports of cross burnings and physical confrontations in meatpacking towns in Iowa, Nebraska, and Kansas (Dalla et al., 2005). This notion that immigration leads to increases in crime is consistent with the assumption of social disorganization theory that population heterogeneity and population influxes result in the weakening of social institutions and crime increases.

Crime as the result of population booms and social disorganization. It has been hypothesized that the sheer increase in population in some communities could foster social disorganization, bringing about an increase in crime. Popular in studies of boomtowns,[2] this hypothesis has also been proposed in studies of slaughterhouse communities (Broadway, 2000, 2007; Broadway & Stull, 2006; Markus, 2005; Stull & Broadway, 2004), and assumes that preboom communities are stable and characterized by social cohesiveness, where social control is made possible by a "high density of acquaintanceship" (Freudenberg, 1986). In areas that experience a population influx, newcomers bring new values that conflict with those of current residents and may disrupt established networks and support systems (Broadway, 1990), perhaps resulting in a reduction of informal social control and increases in personal disorganization and social isolation, exacerbating the frequency of mental breakdowns, suicide, deviance, and social isolation (Broadway, 2000, p. 40).

Increased crime as a result of unemployment. It has also been proposed that slaughterhouse communities experience increased crime rates because the recruitment of workers

from outside the community, coupled with high turnover rates in the meatpacking industry, might result in increased unemployment in the community (Eisnitz, 1997; Schlosser, 2005). Eisnitz (1997) explicitly argues that former slaughterhouse workers may turn to crime due to their unemployment. The empirical research on the relationship between crime and unemployment rates in general (Cantor & Land, 1985), however, has found that the relationship varies by type of crime and is not as straightforward as many assume.

In summary, the demographic characteristics of the workforce, the effects of population influxes on social disorganization, and increased levels of unemployment have all been invoked to explain increased crime rates in communities where slaughterhouses have opened. However, none of these theories have been tested empirically. Additionally, the slaughterhouse community literature has not explicitly mentioned the possibility of a link between the violent work undertaken in slaughterhouses and the social disruption in the surrounding communities. One exception is Broadway (1990), who suggests that work-related stress might contribute to the increases in crime and occurrences of other depression, divorce, and alcoholism. The source of this "work-related stress," however, has not been interrogated. Although the possibility that the killing and dismembering of thousands of animals a day might contribute to work-related stress and crime has not been addressed in the literature on slaughterhouse communities, the link has been raised by green criminology scholars.

Green Criminology and the Slaughtering of Animals

"Green Criminology" (Lynch, 1990) examines "the study of those harms against humanity, against the environment (including space) and against non-human animals committed by both powerful institutions (e.g. governments, transnational corporations, military apparatuses) and also by ordinary people" (Beirne & South, 2007, p. xiii). Within green criminology explicit attention is paid to animals with the aim of developing a "nonspeciesist criminology" (Beirne, 1999; Cazaux, 1999) concerned with taking harm to animals seriously. Thus far, however, attention has focused exclusively on individual actions against companion animals, such as drawing a link between abuse perpetrated within the family and animal abuse (e.g., Fitzgerald, 2005; Flynn, 2000a, 2000b). Several scholars have argued that attention should also be given to institutionalized practices that result in harm to animals but are considered socially acceptable (Beirne, 2002, 2004, 2007; Beirne & South, 2007; Cazaux, 1999; South & Beirne, 2006). In particular, the potential effects of institutionalized harm to animals on those engaged in such activities needs consideration. This leads us to the Sinclair hypothesis—the work of killing animals in an industrial process may have social and psychological consequences for the workers over and above other characteristics of the work.

For example, Piers Beirne (2004) considers slaughterhouses the ideal site for investigating the institutionalized harm to animals and how violence perpetrated against animals might affect the perpetrators, even though the violence is socially sanctioned. He argues that "[w]henever human-animal relationships are marked by authority and power, and thus by institutionalized social distance, there is an aggravated possibility of extra-institutional violence" (2004, p. 54). This proposition parallels studies of other types of work wherein the institutionalized distance and aggression between people can spillover[3] into other social contexts, such as studies documenting extra-institutional violence among military personnel (e.g., Allen, 2000; Marshall, Panuzio, & Taft, 2005; Marshall & McShane, 2000; Mercier, 2000; Rosen,

Kaminski, Parmley, Knudson, & Fancher, 2003) and prison guards (Black, 1982; Kauffman, 1988; Stack & Tsoudis, 1997). It also parallels claims made under the "brutalization hypothesis." According to this hypothesis, instead of having a deterrent effect on homicides, the use of the death penalty (a clear example of state-sanctioned violence) increases homicides due to the legitimization of the use of lethal violence. Research testing the hypothesis, however, has had mixed results depending on the inclusion of a lagged effect (King, 1978), whether the measure of homicides is disaggregated to take the relationship between the offender and victim into consideration (Cochran & Chamlin, 2000; Cochran, Chamlin, & Seth, 1994), and whether the studies are longitudinal or cross-sectional (Yang & Lester, 2008).

More specific to the work in slaughterhouses, ethnographic accounts by Eisnitz (1997), Fink (1998), and Rémy (2003) have emphasized the contradiction faced by slaughterhouse workers between the rules that regulate the slaughter and the necessity of carrying out the killing in an efficient and routinized way. This contradiction is dramatized by the all-too-frequent abuse of animals during the slaughtering process (see Grandin, 1988). Their studies, along with Beirne's proposition and Sinclair's 100-year-old hypothesis, draw our attention to the possibility that negative effects of employment in arenas where institutionalized support for violence exists and employees have total power over others (although circumscribed in some regards; see Sykes, 1980) can result even when the "Others" being subjugated are animals. This study provides an initial test of the propositions of Beirne and Sinclair. In particular, we consider whether or not a relationship exists between slaughterhouse employment levels and community crime rates net of what is explained by the typical correlates of crime and that is unique when compared with other similar industries.

Study Objectives and Research Hypotheses

The general objectives of this study are (a) to test the three theories proposed in the literature to explain increases in crime that are applicable to slaughterhouse communities but afford no special theoretical status to slaughterhouse work and (b) to compare the effects of slaughterhouse employment levels on crime rates with the effects of other industries categorized mainly as manufacturing and similarly characterized by high immigrant worker concentrations, low pay, routinized labor, and dangerous conditions but that do not entail killing and dismembering animals, to see if the effects of slaughterhouses are unique or are congruent with those of enterprises with similar characteristics. Finding unique effects of slaughterhouse employment compared to similar forms of industrial work would point to the type of work undertaken in slaughterhouses as a contributor to the crime increases observed in the communities. Therefore, the general hypothesis tested in this study is as follows:

Hypothesis: Controlling for the variables commonly proposed to explain crime, slaughterhouse presence and employment will be associated with increased crime rates. These increases will be greater than those observed from industries that use the same type of labor force, have high injury and illness rates, and entail routinized labor, but do not involve killing and dismembering animals. In particular, rape and family violence will be influenced by slaughterhouse work, net of other factors.

Testing the hypothesis requires ascertaining whether or not the increase in crime in slaughterhouse communities can be explained by the variables proposed in the literature,

and if the effects are unique to slaughterhouses or if employment rates in similar industries would result in similar increases in crime. The focus on rape and family violence is suggested by scholars such as Adams (1991), Nibert (2002), Patterson (2002), and Spiegel (1996) who posit a connection between the victimization of animals and the victimization of less powerful human groups, such as children and women. It also reflects the claims made by some of the scholars who have studied slaughterhouse communities that the observed crime increases have been propelled by increases in domestic violence and child abuse. Several issues were taken into consideration in designing a study to test this hypothesis, and we describe these next.

Research Design and Methods

The unit of analysis for this study is the U.S. county. Only nonmetropolitan counties not adjacent to metropolitan areas were analyzed to remove the potentially confounding effects of urbanization and spillover from metropolitan areas to rural counties documented in previous research (e.g., Lee & Ousey, 2001). Furthermore, rural counties in states with right-to-work laws,[4] where most slaughterhouse facilities have been relocated to (Stull and Broadway, 2004), are examined here. The result of these criteria is that 581 counties are analyzed in this study (a complete list is available from the authors). The data were compiled from six secondary sources, for the period from 1994 to 2002.[5] Pooled time-series cross-section (TSCS) techniques were used in analyzing the data, therefore the number of data points is 5,229 (581 counties × 9 years of data).

The independent variables are the number of "Animal (except Poultry) Slaughtering" employees in each county for each year and the number of employees in five comparison industries for which bridgeable SIC-NAICS[6] data are available. These data were accessed through the U.S. Census Bureau's County Business Patterns. The number of slaughterhouse employees is used instead of the number of slaughterhouse establishments because it has greater variance (see Table 1) and provides us with more complete information about the magnitude of employment than the number of slaughterhouses, which provides no information about their size. The same is true of the comparison industries used (see Table 2). These include iron and steel forging, truck trailer manufacturing, motor vehicle metal stamping, sign manufacturing, and industrial laundering. These industries were selected because they are similar to the slaughterhouse industry: They are categorized as manufacturing (with the exception of one industry, which was included due to a high rate of immigrant concentration), the industries are characterized by high immigrant worker concentrations, low pay, routinized labor, and dangerous conditions (Bureau of Labor Statistics, 2004a, 2004b; Cortes, 2005; U.S. Census Bureau, 2006). Unfortunately, comparisons could not be made with agricultural production industries, as the Census Bureau's County Business Patterns does not record that information.

There are 22 dependent variables in the analyses, including 14 arrest variables and 8 crime report variables drawn from the Uniform Crime Report.[7] Some of these variables are of particular theoretical interest because they are violent offenses which are implicated by the hypothesis that violence from the slaughterhouses would spillover into the larger community. The other variables (i.e., property crimes) were identified by factor analysis as grouping together with the variables of most theoretical interest. Additionally, it seemed

Table 1
Trends in Slaughterhouse Establishment and Employment Variables, 1994-2002

	Slaughterhouse Establishments			Slaughterhouse Employment		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
1994	0.28	0	6	57.14	0	3,750
1995	0.28	0	4	60.08	0	3,750
1996	0.29	0	4	67.02	0	3,750
1997	0.28	0	4	63.33	0	3,750
1998	0.47	0	5	64.86	0	3,750
1999	0.44	0	5	73.94	0	7,500
2000	0.44	0	5	71.89	0	7,500
2001	0.44	0	5	62.55	0	3,750
2002	0.38	0	4	57.49	0	3,750

Table 2
Slaughterhouse and Comparison Industries Characteristics

NAICS	Name	No. of employees	Immigrant Concentration	Injury/Illness
311611	Animal (except Poultry) Slaughtering	142,374	Part of Food Manufacturing, which is #7 in immigrant concentration	#15 for injury and illness
332111	Iron and Steel Forging	26,432	Part of Fabricated Metal Products, which is #18 in immigrant concentration	#8 for injury / #7 for injury and illness
336212	Truck Trailer Manufacturing	30,678	Part of Motor Vehicles and Equipment manufacturing, which is #35 in immigrant concentration	#12 in injury and #12 in injury and illness
336370	Motor Vehicle Metal Stamping	126,905	Part of Motor Vehicles and Equipment manufacturing, which is #35 in immigrant concentration	#19 in injury and illness
339950	Sign Manufacturing	82,956	Part of Miscellaneous Manufacturing, which is #4 in immigrant concentration	Not among the highest rates
812332	Industrial Launderers	81,908	Part of Personal and Laundry Services, which is #5 in immigrant concentration	Not among the highest rates

Source: Information on the industry classification and number of employees obtained from County Business Patterns Web site (U.S. Census Bureau, 2006). Information on immigrant concentration obtained from Cortes (2005). Information on illness and injury rates obtained from Bureau of Labor Statistics, U.S. Department of Labor (2004a, 2004b).

prudent to include property offences in the analyses as the slaughterhouse community studies documented important shifts in these variables. Consistent with the theorized causes of crime increases the following control variables are used: the number of males in the county aged 15 to 34 years, population density, the total number of males, the number of people in poverty, international migration, internal migration, total non-White and/or Hispanic population, and the unemployment rate (the county population is accounted for in the analyses through its use to create rates in the ordinary least squares (OLS) regression models and as the exposure variable in the negative binomial regression models). (Please see the appendix for the descriptive statistics and zero order correlations among the variables used in the analyses).

The statistical approach used in this study was motivated by two factors: (a) the availability of longitudinal data and (b) the count nature of the dependent variables. In response to the first factor, pooled fixed effects TSCS techniques are used. There are many advantages to the use of this approach. Notably, it makes it possible to control for all time-invariant county-specific variables (such as history and geographic location) not included in the model but which could potentially result in a spurious relationship between the observed independent variables and the dependent variables (Halaby, 2004; Wooldridge, 2002). Because the dependent variables are counts (often with very small numbers) some of the assumptions of OLS regression cannot adequately be met; specifically the assumptions of homogeneity of error variance and normal error distributions are frequently violated with units of analysis containing small population (such as rural counties; Osgood, 2000). Recent criminological studies examining aggregate crime with expected small counts have instead used regression models based on the Poisson distribution (Krivo & Peterson, 2004; Lee, Martinez, & Rosenfield, 2001; Lee & Ousey, 2001; Osgood, 2000; Rosen et al., 2003). However, the basic Poisson regression model assumes that the variance equals the mean. This assumption is often violated in analyses of crime data. Violating this assumption produces underestimates of the standard errors and misleading significance tests. In instances of overdispersion (where variance exceeds the mean), negative binomial regression (using the Poisson distribution) is preferred, as it allows for overdispersion (Long, 1997; Osgood, 2000). Therefore, negative binomial regression, which is a more conservative approach, is used in the analyses conducted here with individual crime variables as the dependent variable.

For some analyses, crime rate variables were created and factor analyzed to create two scales (arrest rate and report rate scales). Using the scales as dependent variables mitigates the assumption violations of OLS regression, creating a more normal distribution of scores than obtained with the counts or rates for particular crimes. To create the scales the counts were first converted into rates. Then principal components analysis was used to determine the factor structure, followed by iterative principal factors to obtain the factor loadings. The resulting Arrest Rate Scale is made up of the following variables: rape, robbery, burglary, other assaults, forgery, possessing stolen property, vandalism, offences against the family, and disorderly conduct.[8] The same process was followed to create the Report Rate Scale.[9] The Report Rate Scale is made up of the following variables: reports of rape, robbery, assault, burglary, motor vehicle theft, and arson. Three pooled TSCS models were run with each of the scales in turn as the dependent variable (each with fixed effects): (a) with the number of slaughterhouse workers as the sole independent variable, (b) with the control variables added, and (3) with the comparison industries added.[10]

Table 3
Multiple Regression With Arrest Scale as the Dependent Variable (N = 4,646)

	Coefficient (Standard Error)		
Independent Variables	Model 1	Model 2	Model 3
Slaughterhouse employment	0.019 (0.004)***	0.013 (0.004)**	0.013 (0.004)**
Unemployment		1.17 (0.346)**	1.164 (0.346)**
Number in poverty		0.0003 (0.0007)	0.0003 (0.0007)
Immigration		0.072 (0.028)*	0.069 (0.028)*
Migration		0.004 (0.003)	0.003 (0.003)
Number of non-Whites and/or Hispanics		0.008 (0.001)***	0.008 (0.001)***
Young males		–0.003 (0.002)	–0.003 (0.002)
Total number of males (0.002)***		–0.009 (0.002)***	–0.009
Population density		–0.563 (0.257)*	–0.556 (0.257)*
Iron and steel forging			–0.204 (0.126)
Truck trailer manufacturing			–0.016 (0.020)
Motor vehicle metal stamping			–0.035 (0.061)
Sign manufacturing			–0.011 (0.013)
Industrial launderers			0.086 (0.062)
Model F value	21.36***	19.83***	19.72***
R^2	.004	.040	.030

*p < .05. **p < .01. ***p < .001.

Results

The results of the OLS regression models with the Arrest and Report Rate Scales in turn as the dependent variables are described first. Then we describe the results of the negative binomial regression models with individual crime variables as the dependent variables.

OLS Regression Analyses

As shown in Tables 3 and 4, the Number of Slaughterhouse Employees variable is a significant predictor in all six models. With the Arrest Rate Scale as the dependent variable (Table 3), the Slaughterhouse variable coefficient decreases from 0.019 to 0.013 with the addition of the control variables, but it remains significant. This means that controlling for all of the variables in the model, when the number of slaughterhouse workers increases by 1 the arrest rate scale increases by 0.013 arrests (p < .01).

The results are more substantial with the Report Rate Scale as the dependent variable (Table 4). Controlling for all of the variables, the coefficient for slaughterhouse employment is 0.027 (p < .01). It is worth noting that none of the comparison industries have significant effects on the Arrest Rate Scale or Report Rate Scale.

By fixing the control variables at their means and adjusting only the number of slaughterhouse employees in a county it is possible to see how different levels of slaughterhouse employment would affect the scales (see Table 5). An average-sized slaughterhouse, which employs 175 people at any given point in time, would be expected to increase the arrest

Table 4
Multiple Regression With Report Scale as the Dependent Variable (N = 4,646)

	Coefficient (Standard Error)		
Independent Variables	Model 1	Model 2	Model 3
Slaughterhouse employment	0.039 (0.008)***	0.027 (0.008)**	0.027 (0.008)**
Unemployment		2.035 (0.662)**	2.027 (0.662)**
Number in poverty		0.006 (0.001)***	0.006 (0.001)***
Immigration		0.264 (0.053)***	0.263 (0.054)***
Migration		0.014 (0.005)**	0.014 (0.005)**
Number of non-Whites and/or Hispanics		0.012 (0.002)***	0.012 (0.002)***
Young males		–0.003 (0.003)	–0.003 (0.003)
Total number of males		–0.019 (0.003)***	–0.019 (0.003)***
Population density		0.308 (0.492)	0.312 (0.492)
Iron and Steel Forging			–0.363 (.240)
Truck Trailer Manufacturing			0.060 (0.038)
Motor Vehicle Metal Stamping			–0.113 (0.117)
Sign Manufacturing			–0.018 (0.024)
Industrial Launderers			0.016 (0.118)
Model F value	21.51***	15.46***	10.39***
R^2	.003	.068	.068

**$p < .01$. ***$p < .001$.

Table 5
Results of TSCS OLS Equation at Varying Levels of Slaughterhouse Employment, Keeping Control Variables Stable (N = 4,646)

Slaughterhouse Employment	Arrest Scale	Report Scale
0 employees	69.32	115.40
10 employees	69.44	115.67
60 employees	70.09	117.01
175 employees	71.56	120.09
375 employees	74.13	125.45
750 employees	78.94	135.50
1,750 employees	91.78	162.30
3,750 employees	117.45	215.90
7,500 employees	165.59	316.39

Note: TSCS = time-series cross-section; OLS = ordinary least squares.

scale by 2.24 arrests and the report scale by 4.69 reports. Particularly telling is the fact that the expected arrest and report values in counties with 7,500 slaughterhouse employees are more than double the values where there are no slaughterhouse employees.

These results demonstrate that the effect of slaughterhouse employment on these scales cannot be explained away by the control variables and that the comparison industries do not have similar significant effects. Also, because the analyses employ fixed effects they also therefore control for time-invariant variables in these counties that might affect the crime rates, such as geographic location. These findings, however, cannot provide insight

into how slaughterhouses, the comparison industries, and the control variables affect individual crime variables. To provide this insight, we used negative binomial regression.

Negative Binomial Regression Analyses

Pooled TSCS negative binomial regression was performed on 11 individual dependent variables (7 arrest variables and 4 report variables).[11] These analyses were modeled with county population set as the exposure variable[12] and county fixed effects. The same three models were run for each of the dependent variables as was done with the OLS regression analyses.

The regressions were performed on the data for two time periods: the entire time period under study (1994-2002) and the period before custom slaughter facilities were added to the slaughterhouse industry category (1994-1997). A few words here regarding this change in classification are warranted. In 1998, custom slaughtering facilities were added to the Animal (except poultry) Slaughtering category (personal communication with Census Bureau representative, May 2, 2006). Custom slaughter includes (a) slaughter or processing of uninspected food animals for the sole consumption of the owner; (b) slaughtering/processing animals as a custom service for an individual who owns the animal, and uses the meat for his or her own consumption. These tend to be very small establishments. This change in classification resulted in an increase in the smaller slaughterhouse facilities from 1997 to 1998 (an increase of 514 facilities employing 1 to 4 people). A potential consequence of this change in classification is that the effects of slaughterhouses on crime in these years could be diluted in the aggregate data by the increase in these small slaughter facilities, an issue that we discuss in more detail below.

The values reported in Tables 6 and 7 are the incidence-rate ratio (IRR)[13] values for the most complete models (Model 3). Analysis of the precustom slaughterhouse period (1994-1997), while controlling for all the control variables, indicates that slaughterhouse employment has a significant positive effect on the total number of arrests and arrests for violent crimes (see Table 6). The IRR value for total number of arrests (1.000454) means that each additional slaughterhouse employee would be expected to increase the total arrest rate by a factor of 1.000454 or approximately 0.05%. Again, although on face value this may not appear impressive, it is important to note that some of the large facilities employ thousands of people, so that the actual effect could be much more substantial. For example, 4,000 slaughterhouse employees would increase the total number of arrests by approximately 2%.

The IRR value for the Arrests for Violent Crimes variable is interpreted to mean that each additional slaughterhouse employee increases the expected number of violent arrests by a factor of 1.000221 or by 0.0221%. Accordingly, 4,000 slaughterhouse employees would be expected to increase the number of arrests for violent offenses by nearly 1%. Note that only one of the comparison industries (motor vehicle metal stamping) has a significant positive effect on any of the crime variables (rape reports) and there are several instances where the comparison industries have significant negative effects.

When the entire time period is examined (Table 7), the effect of slaughterhouse employment on total arrests and arrests for violent crimes is no longer significant in the expected direction. This is likely due to the inclusion of the custom slaughter facilities. However, in the analysis of the entire time period, the slaughterhouse employment variable has a significant positive effect on arrests for rape and for other sex offenses (the effects are in the same direction in the previous analysis, but it is possible that they are significant here because of the increase in data points). Additionally, these effects are not found in the comparison industries.

Table 6
Effects of the Independent and Control Variables (Net of the Other Variables) on the Crime Variables of Interest, 1994-1997 (N = 1,743)

Independent Variables	Total Arrests	Violent Arrests	Murder Arrests	Rape Arrests	Family Arrests	Sex Arrests	Assault Arrests	Index Reports	Murder Reports	Rape Reports	Assault Reports
Slaughterhouse employment	1.000454**	1.000221*	1.000869	1.000059	1.000222	1.000083	1.000196	.9997331	1.001345	1.000008	0.9999967
Unemployment	0.9267538***	0.9981239	1.040852	1.024633	0.9700561	1.031244	1.004418	0.9448218***	0.9880815	0.9971552	0.9490392**
Number in poverty	1.000018*	0.9999896	0.9999166*	0.9999978	0.9999625	0.9998982***	0.9999922	1.000016	1.000019	1.000032	1.000039*
Immigration	0.9990475	0.9968228*	0.9953541	0.9979653	1.003668**	1.000434	0.9965581*	1.002738***	1.000711	1.000913	1.000715
Migration	1.000243***	0.9999918	1.000304	0.9999951	0.9998443	0.9999715	0.9999702	0.9999195**	1.000048	0.9997468**	0.999887*
Non-White/ Hispanic	1.000464***	1.000038*	1.000049	1.00001	1.000015	1.000006	1.000036	0.9999082***	1.00006	1.000065	0.9999471**
Number of young males	0.9994193***	1.000081	0.9996847	1.00012	1.000025	0.9998274	1.000141	1.000807***	0.9997969	1.000182	1.00056***
Total number of males	0.9993236***	0.9998762**	1.000111	0.9998887	0.9998898*	0.9999842	0.9998497***	0.9997796***	1.000049	0.9999179	0.9997982***
Population density	1.073137	0.9988433	0.9972847	1.036529	1.002707	1.00699	1.000122	0.9891606**	0.9937794	0.9966124	1.000516
Iron and Steel Forging	0.9968899	0.989946	1.031706	0.9604903*	1.024801	1.001263	0.9894973	1.005325	1.037114	0.9883354	0.9877602
Truck Trailer Manufacturing	0.9979979***	0.9980742**	0.9979514	0.9997399	0.9983923	1.000406	0.997983**	1.000048	0.9995342	0.9996249	0.9987897
Motor Vehicle Metal Stamping	0.9992525	0.9946924*	0.9985286	0.9992979	0.9985946	0.9997529	0.9953782	0.9941526**	1.000061	1.072275*	1.00843
Sign Manufacturing	1.003135	1.000377	1.004712	1.002019	0.9996684	1.003013	0.999614	0.9896203***	0.9935767	0.9949149**	0.9920695***
Industrial Launderers	1.006312	1.00489	.9862215	0.9974364	1.011544	1.009035	1.00595	1.005605	0.993868	1.005044	1.004502

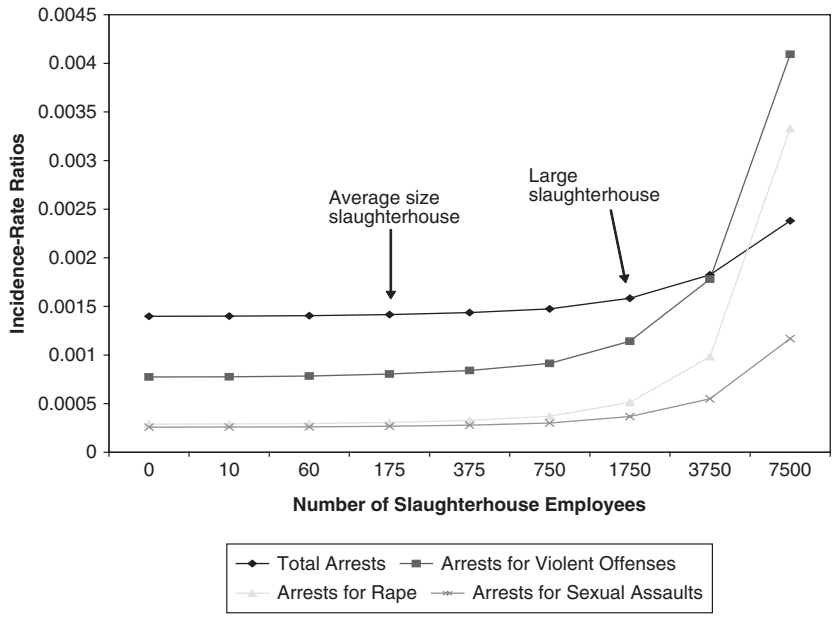
*p < .05. **p < .01. ***p < .001.

Table 7
Effects of the Independent and Control Variables (Net of the Other Variables) on the Crime Variables of Interest, 1994-2002 (N = 4,646)

Independent Variables	Total Arrests	Violent Arrests	Murder Arrests	Rape Arrests	Family Arrests	Sex Arrests	Assault Arrests	Index Reports	Murder Reports	Rape Reports	Assault Reports
Slaughterhouse employment	0.9993113***	0.9993811***	1.000044	1.000327**	0.9996448***	1.000202*	0.9994051***	0.999141***	1.000081	0.9993045***	0.9992509***
Unemployment	1.024472***	1.01407*	1.017718	1.049572***	0.9748383**	1.008044	1.013346*	0.9803073**	1.001645	1.001668	0.9848345*
Number in poverty	1.000004	1.000008	0.9999858	1.000019	0.9999584*	0.9999497**	1.00001	1.00003**	1.000037*	1.000008	1.000034**
Immigration	0.9998359	1.000491	1.000039	1.000373	1.001244*	1.001403*	1.000503	1.002717***	0.9999194	1.001314**	1.002496***
Migration	1.000391***	1.000358***	1.000429***	1.000305***	1.000048	1.000068	1.000332***	1.000353***	1.000269**	1.000144**	1.000348***
Non-White/ Hispanic	1.000103***	1.000055***	1.000065***	1.000068***	1.00004***	0.9999926	1.000047***	1.000063***	1.000084***	1.000036**	1.000027***
Number of young males	0.9999787*	0.999984	1.000046	0.999983	0.9999822	0.999893**	0.9999805	0.9999704*	0.9999701	0.9999002***	0.9999574*
Total number of males	0.9998677***	0.9998769***	0.9999138***	0.9999041***	0.9998871***	0.9999781	0.9998815***	0.9999053***	0.9999452*	0.999974	0.9999168***
Population Density	1.00558***	1.002586	1.003975	1.000542	1.003551*	1.002014	1.003026*	0.9985326	1.003147	1.000152	0.9996134
Iron and Steel Forging	0.9921377***	0.9918974***	0.9957149	0.9926863*	0.9944603**	0.9924746	0.9924163***	0.9959642**	1.005719	0.9969287	0.9926321***
Truck Trailer Manufacturing	0.9992624*	1.000008	0.9994264	1.000295	1.0002	1.000339	1.000083	1.000966**	0.9998746	1.000313	1.000424
Motor Vehicle Metal Stamping	1.000723	0.9993025	1.000228	1.000279	0.9997799	1.001256	0.9995619	0.9993088	1.000025	0.9989647	0.998472
Sign Manufacturing	1.000269	1.000019	1.000082	0.9997824	0.9999199	0.9999348	1.000124	0.9972855***	0.9998537	0.9992095	0.9980522**
Industrial Launderers	1.002269*	1.000014	1.000547	0.999034	1.001069	1.000004	0.9998854	1.004173***	1.002587	1.000645	1.001481

*$p < .05$. **$p < .01$. ***$p < .001$.

Figure 1
Log Scale Prediction Equation Values for Total Arrests, Arrests for Violent Offenses, Rape, and Sexual Assaults



With these data we can estimate the effects of varying levels of slaughterhouse employment on the four variables that slaughterhouse employment significantly predicts. Figure 1 demonstrates how the effects of slaughterhouse employment on these variables become particularly pronounced with higher levels of employment in the industry.

Discussion and Conclusions

We anticipated that controlling for key variables (the number of young men in the county, population density, the total number of males, the number of people in poverty, international migration, internal migration, total non-White and/or Hispanic population, unemployment rate, and the total county population), slaughterhouse employment levels would be associated with increased crime rates in counties, and that the effects would be greater than the effects of employment in the comparison industries. Two techniques were employed to test this hypothesis. The first technique is OLS regression using the arrest and report scales in turn as the dependent variable. The results using this technique are consistent with our hypothesis: Slaughterhouse employment is a significant predictor of both the arrest and report rate scales with all the control variables included in the model. The comparison industries do not have parallel effects: none of the comparison industries have significant positive effects on the Arrest and Report Scales.

Positive effects of slaughterhouses employment levels on crime rates were also found using pooled TSCS negative binomial regression to regress individual arrest and report

variables. In the results derived from the entire time period, and controlling for the extraneous variables, slaughterhouse employment has significant effects on arrests for rape and arrests for sex offenses. Of the comparison industries, only iron and steel forging demonstrates a significant effect on arrests for rape, but it is a negative one. Thus, controlling for the other variables, an increase in employment in iron and steel forging is associated with a *decrease* in arrests for rape.

The effects of slaughterhouse employment on the arrests for rape and other sex offenses are not significant in the analysis of the data prior to the inclusion of custom slaughter facilities (1994-1997). This is not surprising given that the analysis of the entire time period includes more than double the number of observations than the period before the inclusion of custom slaughter facilities. For the analyses of the entire time period (1994-2002), 4,646 observations are analyzed (581 counties × 8 years [8 years of observations instead of 9 are included in the analyses as the result of the one year lag] − 2 missing cases = 4,646]. For the analyses of the time period before custom slaughter facilities were added to the slaughterhouse categorization (1994-1997), 1,743 observations are analyzed (581 counties − 3 years = 1,743). Slaughterhouse employment is a significant predictor of two variables for the period before custom slaughter facilities were added to the slaughterhouse categorization: total arrests and violent arrests. Only one of the comparison industries (Truck Trailer Manufacturing) has a significant effect on the total arrests variable, but it is a negative effect and therefore an increase in the number of truck trailer employees in these counties would be expected to *decrease* the number of total arrests.

The IRR value for the slaughterhouse employment variable in predicting violent arrests is 1.0002 (rounded), controlling for the other variables. Two of the comparison industries (Truck Trailer Manufacturing and Motor Vehicle Metal Stamping) have significant effects on violent arrests, but both are negative. Again, we would therefore expect that an increase in the number of employees in these industries would be associated with a decrease in the number of arrests for violent offenses. Thus, the results of the pooled TSCS OLS regression and pooled TSCS negative binomial regression both demonstrate that slaughterhouse employment does have significant positive and unique effects on the Arrest and Report Rate Scales, as well as on rates of total arrests, arrests for violent crimes, arrests for rape, and arrests for other sex offences, controlling for the number of young men in the county, population density, the total number of males, the number of people in poverty, international migration, internal migration, total non-White and/or Hispanic population, the unemployment rate, and the total county population.

The effect of slaughterhouse employment on offenses against the family was significant and negative for the analysis of the entire time period, and positive but not significant for the analysis of the 1994-1997 data. The negative effect found in the 1994-2002 analysis may be the result of including the custom slaughter facilities. It is also worth noting that the Offenses Against the Family variable consists of unlawful *nonviolent* acts by family members against each other (U.S. Department of Justice and Federal Bureau of Investigation, 2004). Therefore, there is not a clear measure of family violence in the Uniform Crime Reports that includes violence against family members. Perhaps the inclusion of violent forms of offenses against the family in this variable would have made the effects of slaughterhouse employment clearer. Additionally, we cannot assess the effect of slaughterhouse employment on reports of offenses against the family, because, as previously mentioned, only data on reports for Part I or Index offenses are collected (including murder, rape, robbery, aggravated assault, burglary, larceny, motor vehicle theft, and arson).

Increases in slaughterhouse employment had a significant positive effect on rape arrests across the entire time period under study. However, this effect was not significant when fewer observations were analyzed for the period before custom slaughter facilities were added (1994-1997). Similarly, slaughterhouse employment did not have a significant effect on reports of rape for the years 1994 to 1997. Slaughterhouse employment did have a significant negative effect on the rape reports variable for the analysis of the entire time period. It is possible that this result was impacted by the inclusion of the custom slaughter facilities.[14]

The significant positive effect of slaughterhouse employment on sex offenses is also noteworthy. Although this variable excludes forcible rape and prostitution, it does include sexual attacks on males, incest, indecent exposure, statutory rape, and "crimes against nature" (U.S. Department of Justice and Federal Bureau of Investigation, 2004). Many of these offenses are perpetrated against those with less power, and we interpret this as evidence that that the work done within slaughterhouses might spillover to violence against other less powerful groups, such as women and children. Further, the positive effects of slaughterhouse employment on rape and other sexual assaults were not observed in the comparison industry analyses.[15]

The results presented here therefore demonstrate significant and unique effects of slaughterhouse employment on several crime variables. These effects are not found in the comparison industries, and they cannot be explained by unemployment, social disorganization, and demographic variables. Additionally, the differences in the results before and after custom slaughter facilities were added to the slaughterhouse category also suggests that the industrialization of slaughter has the strongest adverse effects, whereas the addition of the smaller, custom slaughter facilities likely adds "noise" to the analyses and may even be adding the effects of social capital (related to small businesses and small-scale agriculture). Given the highly stochastic nature of the arrest and report variables in rural counties, the findings presented here are quite suggestive.

A few words on the performance of the control variables are in order. Recall that the control variables have gathered into three groupings in the literature: demographic, social disorganization, and unemployment. The control variables with the most explanatory power in predicting the crime variables in this study include the unemployment variable and some of the social disorganization variables (specifically migration and immigration). The effects of the demographic variables were largely contradictory and close to zero. The arguments that have been used to explain the slaughterhouse effect overall find limited substantiation here, again supporting the claim that there is something unique about slaughterhouse work.

The major limitation of our study is the reliance on Uniform Crime Report (UCR) data. Although many studies of crime rely on the UCR for their data (such as Kawachi, Kennedy, & Wilkinson, 1999; Krivo & Peterson, 2004; Lee & Ousey, 2001; Wilkinson, Reynolds, et al., 1984), shortcomings of the data have been identified. For instance, official statistics obviously exclude those crimes that law enforcement officials are not aware of. However, for some offenses, such as motor vehicle theft and homicide (Kawachi et al., 1999), and serious crimes more generally (Sampson, 1987), the undercount is trivial. There are also problems related to the ability of victims and witnesses to recall and report accurate information, limitations of police resources for making arrests, and inconsistencies in the deployment of resources and enforcement of laws across geographic areas (Krivo & Peterson, 2004; Sampson & Groves, 1989). The validity of official statistics has been questioned particularly in areas undergoing rapid growth. It is possible that increases in official crime rates in growing areas are the result of increases in police staff, additions which are common in boomtowns. It is also possible that

increases in crime rates in boomtowns might be partly due to increased reports by law enforcement officials in an attempt to justify increasing their resources (Gold, 1982). On the other hand, residents in stable areas have been known to assert that the police record even minor incidents because their time is not occupied with serious offenses (Freudenberg & Jones, 1991), thus potentially increasing crime rates at the less severe end of the spectrum. Some have suggested that victimization data be used instead of arrest and report data; however, victimization data are more limited and few differences have been found between the arrest rates of the UCR and offending rates estimated from the national victimization survey (Sampson, 1987). Despite the critiques of official arrest and report data, these data are the best sources of systematic and timely offense information at the county level (Miles-Doan, 1998).

Our results cannot be generalized to counties in states without right-to-work laws and to counties in or adjacent to metropolitan areas. Subsequent research expanding these delimitations might provide interesting information about the effects of labor unions and urbanization on social disruption in communities surrounding slaughterhouses.

Finally, the aggregated level of the data poses three limitations: (a) There may be inconsistencies in reporting across counties and the small number of certain types of crime (such as homicide) may make reliable estimates difficult (Pridemore, 2005). However, given the scope of this study and the need for comparable crime data at a fairly low level of aggregation, there are no viable alternatives to using official crime data at the county level. (a) Because of spatial aggregation, the effects of slaughterhouses might be muted and thus make the analysis rather conservative. (c) These data provide a broad picture, but do not enable gaining a clear understanding of the dynamics in these communities, such as who is actually committing the crimes, or if some jobs in slaughterhouses are more problematic than others. Thus, although this study does not permit one to draw conclusions about the individuals who work in slaughterhouses, it nonetheless is a first step in better understanding what is occurring in slaughterhouse communities. It is therefore an important complement to micro-level survey or ethnographic research that would permit a more nuanced analysis of what is occurring in the work and life experiences of those involved in the slaughterhouse industry but would not allow the detection of overall patterns and control for alternative theoretical explanations.

In conclusion, despite some limitations, our research makes valuable theoretical and empirical contributions to a developing sociology of the slaughterhouse. This study is the first to test the theories proposed to explain increased crime in slaughterhouse communities,[16] providing evidence that elaborates on the case study research that initially documented increased crime in communities where large slaughterhouses were sited. The inclusion of comparison industries as well as standard predictors of crime rates in our analyses supports the claim that slaughterhouses have a unique and insidious effect on the surrounding communities. Although studies have found that employment in the manufacturing sector in general has suppressant effects on crime (e.g., Lee & Ousey, 2001), this is clearly not the case for the slaughterhouse subsector of manufacturing. Meaningful theoretical and empirical distinctions can and ought to be drawn between slaughterhouse employment and other types of manufacturing employment. In particular, our results lend support to the argument, first articulated by Sinclair, and since elaborated by Beirne, that the industrial slaughterhouse is different in its effects from other industrial facilities. We believe that this is another of a growing list of social problems and phenomena that are undertheorized unless explicit attention is paid to the social role of nonhuman animals.

Appendix
Descriptive Statistics and Zero Order Correlations

Descriptive Statistics and Zero Order Correlations, Independent Variables, Control Variables, and Summary Arrest Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Slaughterhouse employment	1											
2. Slaughterhouse establishments	.338	1										
3. Total arrests	.021	.015	1									
4. Violent crime	−.013	−.05	.545	1								
5. Number in poverty	.08	.133	.398	.361	1							
6. Unemployment rate	−.062	−.12	.322	.381	.344	1						
7. Immigration	.513	.188	.095	.052	.366	.163	1					
8. Migration	−.176	−.080	−.035	.023	−.139	−.071	−.198	1				
9. Non-White or Hispanic residents	.113	.058	.362	.354	.822	.426	.477	−.231	1			
10. Population density	.080	.054	.358	.3122	.548	.171	.169	.007	.425	1		
11. Number of males	.168	.213	.344	.294	.880	.173	.439	−.119	.700	.597	1	
12. Males aged 15 to 34 years	.187	.195	.304	.257	.849	.187	.510	−.176	.727	.552	.959	1
Mean	64.26	0.37	3348.05	99.07	2239.99	5.02	15.95	−33.84	3077.25	22.2	6816.09	1988.33
Median	0	0	3002.79	67.97	1281.50	4.20	3	−25	764.5	12.54	4529	1184
Standard deviation	402.36	0.65	2605.23	111.06	2548.04	3.06	47.48	260.96	5449.53	32.09	6908.21	2394.04
Minimum	0	0	0	0	8.25	1	−6	−4,083	1	0.1	34	3
Maximum	7,500	6	27,044	1,288	21,450	38.4	777	3,281	47,049	519	66,194	22,118

Note: Correlations and descriptive statistics for dependent variables are shown as crime rates per 100,000 population.

Descriptive Statistics and Zero Order Correlations, Independent Variables, Control Variables, and Individual Arrest Variables

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1.	Slaughterhouse employment	1																	
2.	Slaughterhouse establishments	.338	1																
3.	Murder	−.011	−.026	1															
4.	Rape	.036	.022	.116	1														
5.	Robbery	−.008	−.025	.229	.249	1													
6.	Aggravated assault	−.016	−.052	.216	.297	0.500	1												
7.	Other assaults	.076	.026	.194	.286	.495	.482	1											
8.	Sex offenses	.029	.016	.092	.147	.182	.218	.325	1										
9.	Offenses against the family	−.004	−.017	.129	.168	.330	.269	.352	.193	1									
10.	Disorderly conduct	.029	−.015	.161	.188	.384	.345	.522	.185	.312	1								
11.	Number in poverty	.080	.133	.145	.206	.436	.311	.445	.122	.216	.311	1							
12.	Unemployment rate	−.062	−.120	.178	.151	.331	.349	.319	.102	.235	.284	.344	1						
13.	Immigration	.513	.188	−.009	.038	.068	.048	.144	.050	.011	.023	.366	.163	1					
14.	Migration	−.176	−.080	−.001	−.006	−.031	.032	−.089	.019	−.017	−.092	−.139	−.071	−.198	1				
15.	Non-White or Hispanic residents	.113	.058	.168	.197	.469	.294	.466	.120	.253	.322	.822	.426	.477	−.231	1			
16.	Population density	.080	.054	.095	.145	.310	.287	.360	.098	.166	.182	.548	.171	.169	.007	.425	1		
17.	Number of males	.168	.213	.086	.160	.335	.261	.398	.126	.147	.226	.880	.173	.439	−.119	.700	.597	1	
18.	Males aged 15 to 34 years	.187	.195	.075	.145	.307	.226	.355	.108	.127	.203	.849	.187	.510	−.176	.727	.552	.959	1
Mean	64.26	0.37	3.56	6.44	8.3	80.21	289.45	14.74	48.87	134.18	2239.9	5.02	15.95	−33.84	3077.3	22.2	6816.1	1988.3	
Median		0	0	0	0	0	53.51	218.76	7.67	15.81	70.72	1281.5	4.20	3	−25	764.5	12.54	4,529	1,184
Standard deviation		402.4	0.65	11.64	11.76	15.95	94.96	283.35	23.63	92.21	193.69	2548	3.06	47.48	260.96	5449.5	32.09	6908.2	2,394
Minimum		0	0	0	0	0	0	0	0	0	0	8.25	1	−6	−4,083	1	0.1	34	3
Maximum		7,500	6	366.1	245.1	174.98	1143.4	2108.6	530.51	1680.2	2098.6	21450	38.4	777	3,281	47,049	519	66,194	22,118

Note: Correlations and descriptive statistics for dependent variables are shown as crime rates per 100,000 population.

Descriptive Statistics and Zero Order Correlations, Independent Variables, Control Variables, and Crime Report Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1. Slaughterhouse employment	1																	
2. Slaughterhouse establishments	.338	1																
3. Index reports	.095	.132	1															
4. Murder	−.004	−.022	.197	1														
5. Rape	.086	.082	.544	.135	1													
6. Robbery	.031	.028	.595	.219	.350	1												
7. Assault	.010	.017	.679	.220	.406	.511	1											
8. Burglary	.032	.059	.847	.226	.467	.590	.601	1										
9. Motor vehicle theft	.076	.117	.780	.180	.438	.494	.532	.672	1									
10. Arson	.009	.029	.378	.111	.264	.186	.293	.355	.344	1								
11. Number in poverty	.080	.133	.526	.144	.326	.580	.385	.498	.455	.169	1							
12. Unemployment rate	−.062	−.120	.133	.136	.067	.240	.248	.210	.103	.044	.344	1						
13. Immigration	.513	.188	.283	.026	.180	.173	.150	.204	.261	.071	.366	.163	1					
14. Migration	−.176	−.080	−.074	−.006	−.101	−.116	−.016	−.039	−.031	−.038	−.139	−.071	−.198	1				
15. Non-White or Hispanic residents	.113	.058	.443	.162	.2737	.618	.350	.443	.371	.114	.822	.426	.477	−.231	1			
16. Population density	.080	.054	.416	.082	.258	.401	.294	.318	.355	.1443	.548	.171	.169	.007	.425	1		
17. Number of males	.168	.213	.562	.081	.346	.492	.341	.455	.475	.171	.880	.173	.439	−.119	.700	.597	1	
18. Males aged 15 to 34 years	.187	.195	.517	.073	.320	.457	.316	.4138	.425	.147	.849	.187	.510	−.176	.727	.552	.959	1
Mean	64.26	0.37	1827.9	3.25	14	15.743	142.1	429.53	87.83	11.83	2239.99	5.02	15.95	−33.84	3077.25	22.2	6816.09	1988.33
Median	0	0	1523.5	0	0	0	83.20	367.60	70.19	0	1281.50	4.20	3	−25	764.5	12.54	4,529	1,184
Standard deviation	402.36	0.65	1611.9	8.82	20.88	31.55	181.13	390.19	88.16	22.51	2548.04	3.06	47.48	260.96	5449.53	32.09	6908.21	2394.04
Minimum	0	0	0	0	0	0	0	0	0	0	8.25	1	−6	−4,083	1	0.1	34	3
Maximum	7,500	6	9630.4	173.71	245.1	405.34	2808.7	3076.9	697.67	528.17	21,450	38.4	777	3,281	47,049	519	66,194	22,118

Note: Correlations and descriptive statistics for dependent variables are shown as crime rates per 100,000 population.

Notes

1. Similar contradictions have been noted in examinations of vivisection (see Adams, 2000; Balcombe, 2000; Dunayer, 2000; Fox, 2000). Animals are used in experiments precisely because they share many characteristics and qualities with humans, and all the while linguistic devices are employed to distance the experimenters from their subjects.

2. Boomtown communities are characterized by the following features: They experience unprecedented population growth within a short amount of time; relatedly, they experience expanded employment opportunities; and they also experience heavy demands on social services (Camasso & Wilkinson 1990).

3. The use of the term *spillover* here derives from the cultural spillover of violence theory developed by Larry Baron and Murray Straus (1987, 1988; Baron, Straus, & Jaffe 1988). The central tenet of this theory is that

> The more a society tends to endorse the use of physical force to attain socially approved ends—such as order in the schools, crime control, and military dominance--the greater the likelihood that this legitimation of force will be generalized to other spheres in life, such as the family and relations between the sexes, where force is less approved socially. (Baron et al., 1988, p. 80)

Although the authors did not specifically discuss the slaughter of animals as part of this process, we argue here that it is a possibility.

4. In these states, employees cannot be required to join or pay dues to a union and may resign from the union at any time, but still enjoy the benefits of the collective agreement. The following are the right-to-work states included in the analyses in this study: Alabama, Arizona, Arkansas, Georgia, Idaho, Iowa, Kansas, Louisiana, Mississippi, Nebraska, Nevada, North Carolina, North Dakota, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, and Wyoming.

5. This time period is used because due to reporting changes in the Uniform Crime Report data, data prior to 1994 are not comparable with data from later years, and at the time of the study some of the demographic variables were not yet available at the county level for 2003 and later.

6. In 1998, the classification of industries changed from the Standard Industrial Classification (SIC) system to the North American Industry Classification System (NAICS), and only some industries remain comparable across the time period.

7. The arrest variables used include the following: Total arrests, Violent offenses, Murder, Rape, Offenses against the family, Sex offenses, Assault, Robbery, Burglary, Forgery, Possessing stolen property, Vandalism, Other assaults, and Disorderly conduct. The report variables used include: Index offenses, Murder, Rape, Assault, Robbery, Burglary, Motor vehicle theft, and Arson.

8. The factor loadings are all above the commonly accepted minimum values of 0.3 to 0.4 and the Chronbach's alpha for the scale is .6728.

9. Again, all of the loadings for these variables were above the acceptable range and Chronbach's alpha was .6062.

10. As is commonly done in panel studies, in the analyses here the Slaughterhouse Employment variable and the comparison industry variables were lagged 1 year because their impact on crime would likely not be felt in the same year in these counties. More likely, the impact would be felt the following year (especially in cases where the industry opened or expanded late in the year).

11. The variables analyzed include the following: Total number of arrests, Arrests for violent crimes, Arrests for murder, Arrests for rape, Arrests for offenses against the family, Arrests for sex offenses (excluding rape), Arrests for aggravated assault, Total reports for index offenses, Reports of murder, Reports of rape, and Reports of assault.

12. Negative binomial regression requires that an exposure variable be identified to differentiate across cases differences in the possibility of being "exposed" to the effect. Long and Freese (2006) use the example of time as an exposure variable. In this study, however, it is not time that differentiates the likelihood of crime in the counties but the differences across counties in population (a larger number of people makes the possibility of offending or being victimized greater). Therefore, we set county population as the exposure variable. Including the exposure variable adds the natural log of the size of the population at risk to the model. Thus, in essence, the model analyzes per capita rates of crime instead of merely counts of crime even though the dependent variable is

a count, not a rate. This is standard practice in the quantitative criminology literature (Osgood, 2000). Using the population as the exposure variable also permits an acknowledgement in the model that rates based on larger populations have greater precision, which addresses the issue of heterogeneity of variance, which is problematic in the use of OLS regression on count variables (Krivo & Peterson, 2004; Osgood, 2000)

13. The IRR values can be interpreted as the multiplicative factor by which a one unit change in the independent variable affects the dependent variable, controlling for the other variables. Therefore, an IRR value below one indicates that the predictor variable (controlling for the other variables) decreases the incidence-rate, which demonstrates a negative effect. Accordingly, an IRR value above one indicates an increase in the incidence-rate, or a positive effect.

14. The change in classification to include small custom slaughterhouses in the slaughterhouse category may affect these analyses in two ways. If the years after the reclassification are included, due to the way the County Business Patterns categorizes the employee data (e.g., 1-19, 20-99) instead of reporting the exact number of employees, the inclusion of small custom slaughter facilities could artificially increase the number of slaughterhouse workers in counties since the midpoint of the ranges are used in the analyses, therefore diluting the possible effect of slaughterhouse employment. In addition, work at a custom slaughterhouse may be episodic, involving the slaughter of a relatively small number of animals in any given time period rather than the routinized slaughter of the larger facilities. This means that workers may be less exposed to slaughter. If the years after the reclassification are excluded, then these problems are avoided but the sample size is reduced from 4,646 to 1,743, reducing the power of the analysis. Although this seems like a large sample, given the highly stochastic nature of crime in rural communities, substantial power is required to see significant effects. Unfortunately, there is no way to disaggregate the slaughterhouse data and exclude these facilities from the analysis.

15. It is also possible that if violent offenses committed by family members were included in the offenses against the family category that the effect of slaughterhouse employment on offenses against the family would have been positive and significant (instead of *positive* but *not significant* for the period prior to the inclusion of custom slaughter facilities).

16. This study should not, however, be considered the definitive testing of these theories, or predictive models of crime in general. Different operationalizations of the theories might have resulted in slightly different findings. Further, The R^2 values of the models are low; however, the purpose of this research was to control for the variables implicated in the theorized causes in the literature to assess the effects of slaughterhouse employment. It is also worth noting that there is some degree of multicolinearity among the variables. Specifically, the total number of males, number of young males, and the number of people in poverty have variance inflation factor (VIF) values greater than 4 (the values are 19.25, 15.64, and 8.01, respectively). Because this colinearity is entirely among control variables, it has no important effect on the estimates of the effects of slaughterhouse employment (the VIF value of the lagged slaughterhouse employment variable is 1.47).

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Amy J. Fitzgerald is an assistant professor in the Department of Sociology, Anthropology and Criminology at the University of Windsor in Ontario, Canada. Her research interests include examining the implications of animal slaughtering on communities, green criminology more generally, and gendered violence. Her recent publications include *The Animals Reader: The Essential Classic and Contemporary Writings* (2007) and *Animal Abuse and Family Violence: Researching the Interrelationships of Abusive Power* (2005).

Linda Kalof is a professor of sociology at Michigan State University. She studies the cultural representations of humans and other animals and the links between culture and nature. Her publications include *Looking at Animals in Human History* (2007), *A Cultural History of Animals in Antiquity* (2007), *The Animals Reader: The Essential Classic and Contemporary Writings* (2007) and *The Earthscan Reader in Environmental Values* (2005).

Thomas Dietz is a professor of sociology and crop and soil science, Director of the Environmental Science and Policy Program, and Assistant Vice President for Environmental Research at Michigan State University. His research interests include the anthropogenic drivers of environmental change, deliberation in environmental policy and the social psychology of environmental concern.

Easton Courier
Community Matters – Your Local Voice

Neighbors Sue ZBA Over Approved Slaughterhouse

PUBLISHED ON *June 16, 2021* by *Ann Marie Somma*

A group of Tranquility Drive residents are suing the Zoning Board of Appeals after it refused last month to deny a permit to allow a slaughterhouse to operate on their street.

"We aren't giving up on this thing, this is baloney," said Joe Calzone, a Tranquility Drive

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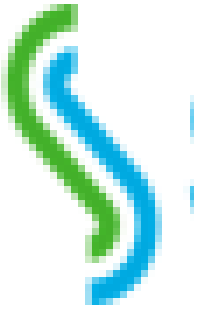
In May the five-member board voted 4 to 1 with conditions to uphold a permit to allow a 10-by-10 slaughterhouse with a sink and separate 1,500-gallon polyethylene tank, a tool shed, and two chicken coops to be built at 59 Tranquility Drive. Residents had appealed to the board to deny the permit citing environmental and health concerns as well as decreased property values.

So now residents are suing the ZBA. In a lawsuit filed in Bridgeport Superior Court the residents claim the ZBA's decision to uphold the permit violates Connecticut law. A commercial poultry business is not a permitted use in the Residence B zoning district, the lawsuit claims. Nor are the slaughtering, processing, and packaging of chickens. The suit also claims that a commercial poultry business is not a permitted accessory use to a principal residential use, and that a slaughterhouse is not a permitted accessory structure to a principal residential structure.

"This violates the most important mandate in the Easton zoning regulations, which is to protect the character and integrity of residential neighbors," said Charles Willinger, the attorney for the residents. "We believe we

Jesse Lee Church...



EMS to Mark 75th...

60th Annual Mark Twain...

Andrew Blum of Trumbull purchased the three-acre lot on 59 Tranquility Drive for $183,000 last year under the Connecticut State Police Barracks trust with the intent of operating a chicken farm. He finds the lawsuit a shame.

“It’s a shame that the neighbors are still fighting this and are not willing to have a reasonable discussion to keep the peace. I don’t like being at war,” said Blum, who currently lives in a 1,200-square-foot home he had built on the property.

The plaintiffs, who all live within one 100 feet of 59 Tranquility Drive , want the court to order the ZBA to revoke Blum’s zoning permit.

Blum still needs final approval from the State Department of Agriculture to slaughter the chickens. He also needs to follow the conditions the zoning board of appeals put on his permit, which limit the expansion of his business, and addresses environmental and health concerns such as the removal of toxic waste and by-products, and lighting.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ZBA Approves Slaughterhouse on Tranquility Road

May 24, 2021

ZBA Delays Vote on Permit for Slaughterhouse

May 5, 2021

Neighbors Appeal Plans for Chicken Farm with Slaughterhouse

March 25, 2021

CATEGORIES LOCAL ISSUES, NEWS, TOWN GOVERNMENT •
TAGS ANDREW BLUM, BRIDGEPORT SUPERIOR COURT, CHICKEN SLAUGHTERHOUSE, LAWSUIT, SLAUGHTERHOUSE, TRANQUILITY DRIVE, ZONING BOARD OF APPEALS

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Letter: Using Federal Relief Funds to Replace the Dilapidated EMS Building

NEXT →

Library Kicks off Summer Reading Program

& DR. WILLIAM GALSTON, MODERATED BY WCSU'S DR. DANIEL BARRETT

September 30 @ 7:30 pm - 9:00 pm

USED BOOK FAIR AT THE EASTON LIBRARY

October 2 @ 9:30 am - 4:00 pm

BENEFIT CONCERT FOR CLASP

6:30 pm - 11:00 pm

NATIONAL DRUG TAKE BACK DAY

October 23 @ 10:00 am - 2:00 pm

View All Events

From: mrjlh@yahoo.com
To: Heather Ferris
Subject: Slaughterhouse Proposal
Date: Friday, September 24, 2021 1:09:27 PM

All due respect with the "Slaughterhouse Proposal" located off Hwy 50 in Carson City is a very bad idea. Too close to residents. The smell alone from the holding pins will cause the biggest outcry from the public specifically those living in the Villa Sierra Mobile Home Park and across the street. Especially on hot days. I have lived next door to a slaughterhouse,1 mile away in fact, which was just outside of the city limits. Nice housing tract too. Everyone thought it would be a great idea and bring jobs. When the wind shifted, sometimes you wanted to vomit. City slickers are not accustomed to farm living or it's smells. Noise might be another issue. Cows and sheep are not silent either.

I would suggest their location to be much farther away from any residential areas. Let's not forget the traffic issues that will arise on Hwy 50 in that area. From what direction will the animals be trucked in from? How often, how many trucks, the times considering the current traffic flows? While that location is vacant now and appears to be a good choice, are there any examples of other slaughterhouses being located so close to residential areas that can be used as a comparison. Mine was in Tracy, CA and has since been removed years ago.

One question to ask is how long will the animals be held in the holding pins? Is it 30 minutes, one hour, or several days. Animals defecate and how quickly will it be removed?

That's my 2 cents worth.

Jerry Hess
616 E John St, Ste 20
Carson, Nv 89706

775-291-9669 or
408-646-5808

September 26, 2021

Carson City Planning Commission
108 East Proctor Street
Carson City, NV 89701

Re: LU-2-21-0308 Special Use Permit for Slaughterhouse

As a 5th Generation Nevadan I am entirely against allowing a special use permit for a slaughterhouse within the town.

There are many homes and recreational properties in this proposed area. As evidenced by the denial of slaughterhouse in Douglas County recently, there are many issues and things to think about. It will reduce the quality of life for surrounding properties. I personally would discontinue going out there to hike with my dog and so would many other people. The animals aren't fed and are already upset and making sad noises. The smells. How much water will they need? What are they going to do with the blood and what they dispose of? What about the traffic? It's dangerous being so close to the river and contamination. This proposal is much more suited for a more rural place and NOT within the town that already has to deal with a smelly sewer plant in the middle of town.

OTHER:

Additionally, since I'm addressing the Planning Commission, I'm wondering why someone bought a lot that a "trailer" was on (the northeast corner of Carmine and Dori), had the trailer torn down and is now living in a 5th wheeler on the residential property? They've had an outhouse set up next to the fence a couple times, set an outdoor pool up and settled in with a bunch of junk and other 'sheds". I'm wondering if that's normal in this area and if everyone can do it? Or the guy living on Airport Rd in a camper behind an old trashed mobile home for the last 4-5 YEARS?? I've contacted the Planning Department 2-3 times asking about it and never got a call or message back. I'm wondering why these things are allowed and would like an answer. Is there an active code enforcement officer in Carson City?

Taunee Jensen
P.O. Box 532
Carson City, NV 89702
(775) 813-8661

From: Margie Judge
To: Planning Department
Subject: Carson valley meats
Date: Sunday, September 26, 2021 10:12:33 AM

I am in support of the proposal from Carson valley meats.

Sent from my iPhone

From: Gaelen Lamb
To: Planning Department
Subject: LU-2021-0308 - proposed slaughterhouse
Date: Monday, September 27, 2021 7:17:09 AM

Please consider this email as my vote AGAINST allowing a special permit for a slaughterhouse on east us-50. There are many residents out this way, myself included and a slaughterhouse is not what anyone wants near their home!

Thank-you for denying this permit in advance!!

Sincerely,
Gaelen M Lamb
20 Morris Circle
Carson City, NV 89706
(775)230-4073

From: Laurie Livermore
To: Public Comment
Subject: Proposed slaughter house
Date: Saturday, September 25, 2021 11:06:59 AM

Sent from my iPhone I am opposed to this slaughterhouse in Carson City. I understand they are necessary but Carson is so small we should not have this type of business in our town. If I were a neighbor to that facility I would move. Who wants to be close to a plant that kills animals. Just my opinion!

From: Gaylene Hybarger
To: Planning Department
Subject: Processing plant
Date: Sunday, September 26, 2021 12:30:26 PM

This area is in desperate need of the proposed meat processing plant. Please approve Carson Valley Meats request which will in turn help all of the ranchers in this area.

Mike Lowry
7 Lazy 11 Murray Grey Cattle

Date: 9/27/2021

From: Lucinda Lundin, 104 North Iris Street, Carson City, NV 89703

To: Ms. Heather Ferris, Planning Manager, 108 E. Proctor St., Carson City, NV 89701

Subj: LU-2021-0308, Proposed Slaughterhouse

Dear Ms. Ferris,

I have read the Planning Commission documents, reviewed the Carson Valley Meats website, and the notes and comments generated during the request to use property in Centerville. Because it will be difficult to address some issues after the fact, please consider the following items prior to approval.

1. The term "Local" is not defined. This term needs a solid and enforceable definition. For example, "Local Events, such as fairs, are defined as events that take place within a 50-mile radius of the slaughterhouse facility."
2. Since the facility is purported to be here to support local ranchers, it should be stated that livestock *born and raised* on ranches within a 50-mile radius will receive priority and livestock born and/or raised outside this "local" area will be accepted only if there is sufficient capacity. The term "born and raised" is important to prevent a workaround of bringing livestock in from outside the area and housing it for a month, then calling it "local." "Sufficient capacity" is defined as "less than 60 animals scheduled as of 14 days before harvesting." That is, on the 14th day before the scheduled harvest day, if there are less than 60 animals from Local ranches scheduled for harvest, the remaining openings can be filled by livestock from outside the local area.
3. During the hearings for the proposed facility in Centerville, Carson Valley Meats was willing to mitigate any noise complaints. Again, this needs to be in the Planning Commission requirements and needs to be defined. For example, if more than five complaints are received regarding noise, Carson Valley meats will fund a study commissioned by Carson City from a licensed company specializing in noise mitigation. Measurements will be taken under the same conditions as were in place during the complaint (e.g., 10:00 p.m. the night before harvest with 40 animals in the lot) over three separate occasions, at least one week apart, but no more than one month apart. If the measured sound is 2 dBa, or greater, above ambient, Carson Valley Meats will take steps to reduce sound within 90 days, project completion to be with nine months.
4. Although the documents indicate manure will be cleaned once per week, the document should specify that manure will be cleaned *at the end of every day that live animals have been on the lot*. This will mitigate most odors.
5. Because sheet water may develop during heavy rainfall, steps must be taken to ensure that any runoff will not impact the Carson River. Even after the lot has been cleaned there may be residual bacteria. I was unable to determine from the planning documents how the runoff would be contained but trust the Engineering Division to ensure the plans are adequate.

Thank you very much for your time and attention.

Sincerely,

Lucinda Lundin

From: Lynn Guss
To: Public Comment
Subject: CV meats slaughterhouse
Date: Saturday, September 25, 2021 2:00:59 PM

Please vote NO. Totally against this plan. Why would anyone want to place a slaughter house in a city boundaries.
Besides that its cruel and unhumane.
PLEASE DO NOT DO THIS.

From: Diana Lee DiNucci-Maher
To: Heather Ferris; Jeffrey
Subject: We vote NO on proposed slaughterhouse in Carson City
Date: Sunday, September 26, 2021 8:19:51 AM

Dear Heather,

We both vote no for a Slaughterhouse to be built downtown Carson City on Highway 50 E. at Detroit Road. These do not belong in the city but far away from population in the rural areas.

We are out of town otherwise we would attend to voice our strong opinion against this slaughterhouse.

Thank you,
Diana DiNucci-Maher and Jeffrey Maher
P.O. Box 22242
Carson City, NV 89721
312-339-8482

From: Jeffrey Maher
To: Diana Lee DiNucci-Maher
Cc: Heather Ferris
Subject: Re: We vote NO on proposed slaughterhouse in Carson City
Date: Sunday, September 26, 2021 9:59:19 AM

Heather - To be clear, I am voting NO as well.
There is a reason why Gardnerville and Minden rejected this.
I do not want to be known as: "Carson City - the worst smelling state capital".

Jeff.

On Sun, Sep 26, 2021 at 8:19 AM Diana Lee DiNucci-Maher <ddm8000@gmail.com> wrote:

> Dear Heather,
>
> We both vote no for a Slaughterhouse to be built downtown Carson City on Highway 50 E. at Detroit Road. These do not belong in the city but far away from population in the rural areas.
>
> We are out of town otherwise we would attend to voice our strong opinion against this slaughterhouse.
>
> Thank you,
> Diana DiNucci-Maher and Jeffrey Maher
> P.O. Box 22242
> Carson City, NV 89721
> 312-339-8482

From: Lori McCaskill
To: Planning Department
Subject: Carson Valley Meats Processing Plant
Date: Sunday, September 26, 2021 1:24:53 PM

To whom it may concern:

I would like to offer my support for the Carson Valley Meats proposed processing plant.

Now more than ever, knowing where our food comes from and where it is being processed is paramount to healthy living choices. The dearth of local facilities makes it stressful for the animals being transported out of area, it severely limits processing for local ranchers, and it impacts the cost and quality of the meat that makes it back to our communities.

Karin Sinclair and her staff have proven records of humane treatment, community involvement, and innovative business practices.

I whole heartedly support this meat processing plant. It will bring new revenue, jobs, healthy food options, and so much more to our area. I hope that you support this business model and make it a reality for Northern Nevada.

Thank you for your time,

Lori McCaskill
36 year Northern Nevada resident.

From:	Kat M
To:	Planning Department
Subject:	Public Hearing for Proposed Slaughterhouse for September 29, 2021 - Wednesday
Date:	Sunday, September 26, 2021 11:26:42 PM

To whom it may concern:

I live at 4901 August Drive in Carson City. I was shocked to find out (2nd hand) from my 61 year old neighbor's daughter who took it upon herself to make fliers and go home to home to let us know that there was a proposed SLAUGHTERHOUSE on the planning commission's agenda for Wednesday, Sept. 29, 2021. I understand the local ordinance only requires notice to adjacent properties of 300 ft. I do appreciate the City extending the notification to 1,000 ft. However, I did not even get considered for this notification especially considering the nature of this particular business. You couldn't even notify everyone living within at least a quarter mile of the proposed site. My home must be 1010 feet away. I thank God that my neighbor's daughter came to my home to let me know what was being proposed. Thank you to her.

I have several issues with a slaughterhouse and stockyard in this area, or anywhere in Carson City especially since it is in the City Limits where homes are, where children play, where schools are, where children stand at school bus stops to be picked up. Slaughterhouses were never meant for City limits regardless if it's a general industrial area.

1) The proposed location is not zoned for this type of business (hence the request for a special use permit).

2) There will be a huge negative property value impact not only the residential homes for a ***considerable*** distance but the established businesses in the area.

3) The noise from a "Stockyard" is a significant change in the amount and type of noise experienced in our neighborhoods, the mobile home park, the golf course, the big neighborhood next to the mobile home park and even the businesses in the area. ***It's further proven*** that when the animals are about to be slaughtered, they are under such duress, that they scream and that can be heard outside of the building. Who in the world wants to hear this while enjoying their right to a peaceful home.

4) ***It's been proven*** that the smells and odors coming from a slaughterhouse are a sweet smell of blood. Anyone that has worked or lived by a slaughterhouse knows this and NO Ventilation system can fix that. It will certainly impact the quality of life for everyone and every business for a considerable distance. The smells coming from the stockyard stink of manure, piss, shit and wet ground which were not there before.

5) ***It's proven*** the flies generated from the acres of animal urine and dung will introduce a significantly objectionable characteristic to the area, including wild animals attracted to the blood smell which include but are not limited to: coyotes, turkey vultures, rodents, all birds of prey and that will impact ***every*** neighborhood, household and business in the vicinity.

6) To put this type of business in a flood zone is incredibly careless. If there was a flood in the flood zone, it will contaminate the Carson River. Many people use the Carson River for pleasure. I use it. Carson River is in the back yard of this proposed business. Even people who don't live in the surrounding neighborhoods use the Carson River. We enjoy taking our dogs down there, we go fishing, bullfrog hunting, kayaking and rafting. It will ruin all our outdoor activities that we've enjoyed in this area. How is this okay.

7) Stockyards are well known to be notorious dust bowls, and the dust isn't just dirt, it's feces and urine which is a health hazard to all people who live near the area. With all the wind in our area. How is that okay?

8) The addition of heavy truck traffic will make entering Highway 50 from Sunrise Drive or even E. Nye street more treacherous than it is now. Highway 50 is a nightmare to merge onto and exit off of in the proposed area.

9) I beg of you, chose a place that is not in a flood zone and is not by neighborhoods and is not in the City of Carson. Do you honestly believe that people would have bought their homes if there was established slaughterhouse already there. NO WAY!!! Would you? I wouldn't ever have bought this home knowing there was a slaughterhouse close by.

Note: Where my home resides the wind blows my way all the time. It will destroy my right to enjoy my home with peace, comfort and enjoyment. It will become a cesspool with the smell of sweet blood which equals death and the stench of manure and urine. How in the world would I ever be able to enjoy my home. You will destroy that if you pass this and you will be held liable.

If you want this so bad, put it in your back yard. NOT MINE!. Not my back yard!

I am begging you, please do not put this in my backyard.

I will be attending the meeting on the 29th of September 2021.

Sincerely,

Kathleen McFarlin (Kathleen Marion-Neal is the name for my property)

From:	jack parker
To:	Planning Department
Cc:	jack parker
Subject:	Slaughterhouse & Stockyard HWY 50
Date:	Sunday, September 26, 2021 12:41:08 PM

A stockyard & slaughterhouse less than 1/8 of a mile from our home is a BAD idea!
I've lived like that before it was awful: constant stink you cannot get rid of, infestation of flies ,we had commercial fly traps and commercial sprayers and there was no control please build this further out of town in a less populated area.
Thank you,
Concerned Residents @ 4837 East Nye Lane ,Carson City ,NV 89706
Jack & Sherrie Parker
parker_jack@sbcglobal.net

From: Jim Racobs
To: Heather Ferris
Subject: opposition to slaughterhouse
Date: Saturday, September 25, 2021 5:51:51 PM

Re: Planning Commission Meeting on September 29, 2021, agenda item 13.E, LU-2021-0308

We are writing to state our opposition to the slaughterhouse proposed for Carson City along Hwy 50, east of Detroit Rd. There may be a need for a slaughterhouse in our region, but one should not be located within a populated urban area like this.

There are a number of reasons a slaughterhouse should not be approved within the city, including: the smell; the waste products of manure, offal, and fats; the water consumption; the wastewater; the traffic.

We would oppose a slaughterhouse anywhere within Carson City, even if we did not live within a mile of the proposed site and one of us did not work a quarter mile from it. We are also surprised and disappointed that we had to learn of such a proposal only via social media and just days before the hearing.

Jim Racobs
Yukiko Hayashi
1763 Bliss Ct
Carson City, NV 89701
775-885-1636

From: Rebecca Davis
To: Public Comment
Subject: Slaughterhouse
Date: Friday, September 24, 2021 6:40:57 PM

Sent from my iPhone

From: Rebecca Davis
To: Public Comment
Subject: Slaughterhouse
Date: Friday, September 24, 2021 7:03:03 PM

My home is in Garson Manor. We currently have highway 50 noise and dust from gravel trucks, mining equipment transport, and increasing traffic from Dayton commuters. We have the sewage treatment plant. Our leaders now want to add live meat animals to that inglorious list. We have Maverick fuel station including truck fueling, RV fueling and waste disposal.
Can we get a break?

The area is zoned industrial. When was the area given that designation? 60s? 70s? 80s, when my house was built?

The slaughterhouse needs to be further from homes and retail businesses.

If ranchers and hunters need this service so badly, as they complain, should we not be concerned that the limits concerning the amount of animals at 60 per day will soon be abused. As for the unrestricted process of game animals, what type of game animals? Deer? Coyotes? Bears? Unrestricted!

Ranch owners and hunters are pushing their agenda to meet their needs with no concern for the surrounding homes and retail businesses.

We suffer for their profit.
Un American.

Sent from my iPhone

From: katie somers
To: Heather Ferris
Subject: Slaughter House
Date: Sunday, September 26, 2021 10:55:31 AM

Hello,
I am a Carson City resident and I am absolutely horrified that not only is a slaughterhouse being considered for placement in East Carson, but only residents within 1000 ft radius were notified. This is not something that should even be considered for our community, and as a community member, I'm sure you will agree with me.
Please do not put a slaughter house in Carson City.

Thanks,
-Katherine S.

From: lturnr1@gmail.com
To: Planning Department
Subject: Proposed slaughter house off Detroit Street in Carson City.
Date: Sunday, September 26, 2021 1:52:52 PM

Hello

My name is Randy Turner and I live on Marsh rd. in Carson City. While I understand the necessity of the local ranchers to have a facility to process their live stock close enough to make that processing economically feasible, I believe the proposed location to be too close to homes and business along Hwy 50. I believe that moving the proposed location 5-10 miles east along Hwy 50 and away from the homes, businesses and the Carson River would make the project much more palatable to the citizens of Carson City.

Given that I live in the Hidden Meadows area at the east end of 5th street, the proposed facility would be approximately 3 miles from my home and the North West winds such as we're experiencing today would bring the smell of the slaughter house directly to my door.
I urge the Chamber to reconsider the proposed current location for the processing facility and to move it east past Mound House.

Thank You

From: Donna Ussia
To: Planning Department
Subject: Carson Valley Meats slaughterhouse
Date: Sunday, September 26, 2021 12:26:33 PM

This needs to be approved in my opinion. They.re a local business we need to support in building their small slaughter house. It's not financially possible to ship our local cattle long distances. I am all for supporting our local branches and this is necessary to their ranch.s survival. We need our local ranchers to stay in business. With food shortages already showing, we need our ranchers more than ever.
Donna Ussia

Carson City Planning Commission September 24, 2021

The allowance of a slauterhouse in Carson City is a really bad idea. There were good reasons why Douglas County didn't allow it.

Carson City is in a drought, which may continue. We may need all our water for primary needs. Slauterhouses use a lot of water, Their waste pollutes sewer systems, which also wastes water.

In addition, their smell is terrible and widespread.

They do not supply jobs that people want.

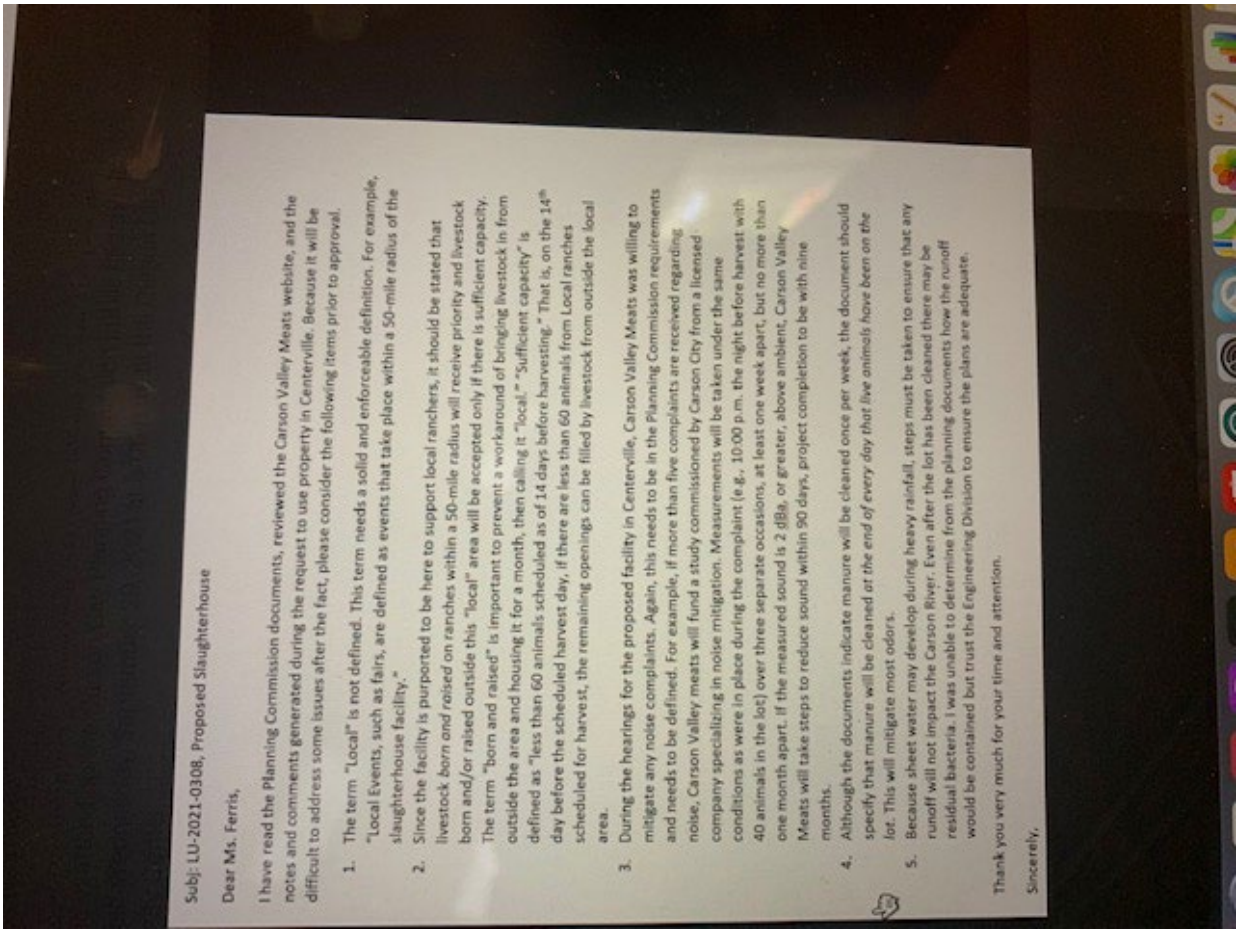
We, also, do not need another carwash in Carson City. Again see the issue of drought and water usage.

Sincerely,

M. Girard
Carson City

From: Charmaine Rickard
To: Planning Department
Subject: Slaughter House
Date: Monday, September 27, 2021 10:52:47 AM

If there is a vote in favor of the slaughterhouse then I agree with Lucinda L. I live on the Eastside of Carson. However, I do not consider a slaughterhouse an appropriate facility for our State Capital.



Subj: LU-2021-0308, Proposed Slaughterhouse

Dear Ms. Ferris,

I have read the Planning Commission documents, reviewed the Carson Valley Meats website, and the notes and comments generated during the request to use property in Centerville. Because it will be difficult to address some issues after the fact, please consider the following items prior to approval.

1. The term "Local" is not defined. This term needs a solid and enforceable definition. For example, "Local Events, such as fairs, are defined as events that take place within a 50-mile radius of the slaughterhouse facility."
2. Since the facility is purported to be here to support local ranchers, it should be stated that livestock *born and raised* on ranches within a 50-mile radius will receive priority and livestock born and/or raised outside this "local" area will be accepted only if there is sufficient capacity. The term "born and raised" is important to prevent a workaround of bringing livestock in from outside the area and housing it for a month, then calling it "local." "Sufficient capacity" is defined as "less than 60 animals scheduled as of 14 days before harvesting." That is, on the 14th day before the scheduled harvest day, if there are less than 60 animals from Local ranches scheduled for harvest, the remaining openings can be filled by livestock from outside the local area.
3. During the hearings for the proposed facility in Centerville, Carson Valley Meats was willing to mitigate any noise complaints. Again, this needs to be in the Planning Commission requirements and needs to be defined. For example, if more than five complaints are received regarding noise, Carson Valley meats will fund a study commissioned by Carson City from a licensed company specializing in noise mitigation. Measurements will be taken under the same conditions as were in place during the complaint (e.g., 10:00 p.m. the night before harvest with 40 animals in the lot) over three separate occasions, at least one week apart, but no more than one month apart. If the measured sound is 2 dBa, or greater, above ambient, Carson Valley Meats will take steps to reduce sound within 90 days, project completion to be with nine months.
4. Although the documents indicate manure will be cleaned once per week, the document should specify that manure will be cleaned *at the end of every day that live animals have been on the lot*. This will mitigate most odors.
5. Because sheet water may develop during heavy rainfall, steps must be taken to ensure that any runoff will not impact the Carson River. Even after the lot has been cleaned there may be residual bacteria. I was unable to determine from the planning documents how the runoff would be contained but trust the Engineering Division to ensure the plans are adequate.

Thank you very much for your time and attention.

Sincerely,

Charmaine Rickard

From: Public Comment
To: Planning Department
Subject: FW: Slaughter house
Date: Monday, September 27, 2021 12:32:56 PM

Rachael Evanson | Office Specialist
Executive Office | Carson City, A Consolidated Municipality
201 N. Carson Street, Suite 2, Carson City, NV 89701
Direct: 775-283-7125 | Office: 775-887-2100 | Fax: 775-887-2286
http://www.carson.org

From: d_j_miley@hushmail.com <d_j_miley@hushmail.com>
Sent: Monday, September 27, 2021 9:34 AM
To: Public Comment <PublicComment@carson.org>
Subject: Slaughter house

September 27, 2021

Attt: Mayor Lori Bagwell and Supervisor Maurice White

Carson City being an urban area, is not the proper venue for a slaughter house/holding area. With intentions being honorable, we will experience the stench and noise that this project will generate, especially when experiencing the eastern winds so prevalent in this area. How would the waste, both solid and liquid be handled?

With all the space available in the surrounding area, why would the Mayor and Supervisors consider a slaughter house in our urban community? The animals would need to be trucked in adding additional traffic to an already over burdened traffic problem? We, are firmly opposed to this proposal.

Sincerely,

Dennis and Nyna Miley
Carson City, NV

From: Connie Anderson
To: Planning Department
Subject: Application for Slaughterhouse
Date: Monday, September 27, 2021 1:06:32 PM

There is no way I would like this on our end of Carson City. I have Ashma and already find it difficult to breathe. With the dust from so many animals, it will be even harder to breathe here. We moved here two years ago hoping this was the perfect community for us. Having this will depreciate our home value as well. We would hope we are not forced to move again. I am totally opposed to this application.

Mrs Connie Anderson
702-308-9513

From: James Anderson
To: Planning Department
Subject: Slaughter House.
Date: Monday, September 27, 2021 1:09:12 PM

I am opposed to the idea of having a slaughter so close to our home. We moved here about 2 years ago ,like it very well, and don't want to move. Please don't let this happen. James Anderson

PLANNING COMM,
LU-2021-0308

RECEIVED
SEP 27 2021
CARSON CITY
PLANNING DIVISION

CC Slaughterhouse,

Some years back the City of Sparks permitted an Animal research (vivisection) facility to occupy a warehouse in that area. I was there and the only discussion about it was "WHEN". It has since moved to another location in Reno and as far as I know is still operating. This was done with little knowledge of the workings of that kind of facility. That facility attempted to utilize Carson Cities 2 Funeral home Retorts at the time for the disposal of their dead animals. It appears they have now installed their own.

Most of the objections to these sort of things are personal and/or emotional. Im not necessarily objecting to this per se, merely suggesting that they be prepared for ahead of time.

I am somewhat aware of the needs of slaughterhouses and would like to suggest a few things for the Commissions consideration beforehand, to Wit-

1. Enforcement and penalties in place ahead of time.
2. The treatment of "downed" and sick animals in Carson.
3. The preclusion of hiring those convicted of animal cruelty statutes anywhere.
4. The disposal of Offal. It used to be fed back. "Mad Cow" may have changed that but it also should not be used in Pet food either.
5. Regulate kill line speed "increases" for any reason. It should be long enough for the animals to become unconscious. Neither Kosher or Moslem law addresses this and you don't have to be religious to be Humane. 14 NRS 132
6. Ignore hardship laws. They are allowances, not mandates and serve profit only.
7. There is no such thing as a "Mary Poppins" slaughterhouse.
8. Proof of necessity.
9. Wild horse slaughtering?

Someone wants to do this in Douglass Co. I do not know the status of that effort. Douglass Co. told me that unless I lived there, they would ignore comments from outsiders.

Back in 2012 it was tried in Wabuska as well. Silver Springs was also suggested.

Jeff Page, Lyon County Mngr.
Yerington NV.
1 Mar. 2012

Dear Mr. Page,

Some time back the City of Sparks NV allowed an animal research facility to settle in Sparks, Basically, the only discussion about it was, when. I knew the RE broker representing the firm as I was selling RE at the time. There was a lot of public objection expressed. This was a brand new thing for NV as, at the time, UNLV and UNR were the only federally licensed animal dealer facilities in the state. Sparks had no guidelines for that type of operation and the subsequent disposal of diseased animals etc. The reason I was acquainted with disposal is because I had worked occasionally for mortuaries here in Carson and the Vivisection Co. had approached them for the use of their retorts.

My point is:-
Someone in NV is proposing the first, full fledged food animal slaughter operation, in Wabuska NV and to my knowledge Lyon Co. has NO Humane slaughter regulations in place to address that. There are a few custom houses like in Fallon for hunters and local ranchers, but most commercial animals are shipped to ID, CA and elsewhere now.

As a property owner in Lyon Co. I would like for this to be addressed in your proposed review of the master plan. It would be a first for the state.

Some items to be addressed would be:
Enforcement and penalty for noncompliance,
The treatment of downed or sick animals,
How the animals are shipped (the 24hr rest period only applies to trains and most animals are shipped by trucks now),
Preclude the hiring of anyone that has ever been convicted of animal or abuse of any kind,
Final disposition of offal. I don't believe it is used in feed anymore because of "mad cow", but that needs to be addressed,
The kill process needs to be established as to time limits. Kill line speed should be long enough for the animal to become un-conscious to pain (Fed. Law) before having its legs cut off, its hide pulled off and its body parts ripped out. The only reason for speeding the line up is to accommodate profit and restrictions to that can be set aside by "hardship" claims. Im sure the "operator" would most likely agree with this approach and not object to a law or ordinance spelling it out.

Any restrictions should apply to ALL public operations and ALL slaughter animals.

There have been cases involving Idaho Beef Processors, Tyson Foods, AgriProcessors and I'm sure others, where the animals were still conscious and bellowing, even after the Jewish Kosher ritual "Shechita" process being applied. Moslems also have a similar religious ritual. The purpose is nullified by these hardship claims.

How will state regulate processing, slaughter?

I would like someone to explain to me the difference between a meat processing plant and a slaughterhouse. I would think the animals would have to be slaughtered before being processed.

Walker River Meat Processing is proposing to create a 300,000-square-foot facility in Wabuska, where all that hot water is, to do both, hopefully in the proper sequence, and not like that outfit up in Washington state did a few years back.

Nobody will be able to stop this, as there is way too much money involved for those who are addicted to it.

Nevada has little to no regulation for the humane operation of this sort of operation, but should have. Anybody besides me thinking about this?

This also would make it more convenient for the Bureau of Land Management to handle the feral horse problem.

13 Dec 11

PETE BACHSTADT
Carson City

lans for meat plant take shape

27 NOV 11

ABO
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ill serve Estell
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Meat
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of choice meats.

"We aren't building a slaughter plant, we are building a meat-processing plant," Estell says.

Estell, chief executive officer of Walker River Meat Processing, plans to break ground next spring on a 300,000-square-foot facility that will process cattle, pigs, sheep and goats.

The plant consists of three buildings located approximately 1,000 feet apart to avoid the possibility of cross contamination. The facility is located on 1,725 acres of land at Wabuska in Lyon County, which leaves plenty of room for Walker River Meat Processing to raise herds of cattle and drifts of pigs once the plant is in full operation.

Verdi-based Sierra Builders has been retained as design/build general contractor, and WB Clausen Structural Engineers of Emeryville, Calif., is the structural engineer.

The meat processing facility will draw livestock for processing from a 1,000-mile radius, Estell says, which extends its reach as far north as Canada and includes the entire western region and even Texas.

The facility will be constructed to U.S. Department of Agriculture standards and the even more-stringent European Union Food Regulations and Standards, Estell says, which will allow participating ranchers to sell their products internationally as well as domestically.

"That gives us the opportunity to market our products to any place in the world," Estell says.

"We are not held up trying to ship to foreign markets."

Contracts already are in the works to process more than 200,000 head of cattle beginning in 2013 when the plant comes on line.

When operating at full

See **Plant,** *Page* **C2**

RECORD COURIER, GARD
14 NOV 2020

A year later, slaughterhouse denial still in court

by Kurt Hildebrand
khildebrand@recordcourier.com

Friday marked a year since Douglas County commissioners denied an appeal of a permit to allow a slaughterhouse on a former Centerville dairy.

A lawsuit is in the hands of Senior Judge Janet Berry, who as of Monday had not issued a ruling or set another hearing.

Sinclair Meats' Karin Sinclair is seeking to overturn a decision that would prevent her from operating a small meat processing plant on the former Storke Dairy.

Under Douglas County code meat processing is permitted on agriculturally zoned land with a special use permit.

More than 100 people spoke at a Nov. 13, 2019, hearing where commissioners heard an appeal of a 4-2 planning commission decision to deny the permit. Planning commissioners were actually deadlocked, but shifted the vote after being told some decision would be required for an appeal to move forward.

Among Sinclair's challenges to the decision are that an email sent by Larry Walsh to residents and cc'd to planning and county commissioners violated the open meeting law.

Berry sought a legal opinion on whether commissioners were allowed to hear testimony from outside experts during the hearing.

The last movement on the case was an Oct. 8 order where Berry denied an attempt to add an Aug.13 column written by a neighbor that was published by The Record-Courier and a gofundme account that proved residents were raising money for outside experts.

She is wading through the recordings of the two meetings and the 1,600-page record of the case.

Even if Berry rules against the county, and that ruling survives appeal, the issue would likely return to county commissioners for a new hearing.

Record-Courier

). 92 Douglas County's Hometown Newspaper since 1880 Saturday, November 16, 20

County denies slaughterhouse appea

by Kurt Hildebrand
khildebrand@recordcourier.com

An appeal of a proposed slaughterhouse in Centerville was unanimously denied by Douglas County commissioners on Wednesday night.

Citing concerns about the flood plain and a septic system that state regulators said they would have to research, commissioners agreed Centerville was the wrong location.

Representatives of the Nevada Department of Environmental Protection acknowledged that they had never evaluated the recirculating vertical flow constructed wetlands system proposed for the site.

About 400 people turned out for the meeting held at the CVIC Hall in Minden. There were more people than could safely fit in the hall, which has a limit of 290 and they were set up in Minden Park with speakers, so they could follow the action.

Residents lined up out the door of the CVIC Hall to have their say in one of the best attended public meetings in Douglas County history.

Several Valley ranchers spoke in favor of the slaughterhouse.

Bently Ranch Manager Matt

SLAUGHTERHOUSE, 4

KURT HILDEBI

Residents sign up to speak at tables set up in Minden Park, where around 60 people listened to a hearing on slaughterhouse at Centerville.

SLAUGHTERHOUSE

From page 1

McKinney pointed out that what people were referring to as toxic was food.

"This is wholesome, healthful food," he said. "This will be the most inspected facility in the county."

Charlie Hone pointed out that if a meat-processing plant can't go on the former Storke Dairy, than where can it go.

Russell Scossa pointed out that most of the homes in the vicinity have septic tanks.

Neighbor Shane Miller, a large animal veterinarian, however said that he was concerned about the potential pollution from the plant.

Miller said that at no point did proponent Karin Sinclair knock on his door, something her representative said she was frightened to do.

Most of the speakers during the recognized the need.

Residents pointed out that the purchase agreement with the owners of the Centerville property was contingent on the approval. Deputy District Attorney Doug Ritchie said Sinclair had standing to appeal a planning commission denial because she was representing the owner.

"This is the most beautiful part of Carson Valley, the opposition is in regard to the location at 88 and Centerville," commissioner John Engels said. "This commissioner will cast no vote for the operation of this permit."

Commissioner Wes Rice urged Sinclair to work with the Douglas County Farm Bureau to find an appropriate location for the slaughterhouse.

"They are hungry for a processing plant," he said. "I would like to see that happen. I just can't get past it being the flood plain."

and wrapped up around 8 p.m. with scores of people getting to speak.

Sinclair does not own any property in Douglas County. She did file on the name Carson Valley Meats with the Secretary of State's Office on July 1.

The R-C first reported on Sept. 4 that the proposal was scheduled to go before the Douglas County Planning Commission for a special use permit.

Meat processing plants are allowed in agricultural zoning with a permit under county code.

Planning commissioners deadlocked 3-3 at their Sept. 10 meeting until member Maureen Casey switched her vote to no so Sinclair could appeal the decision.

It has been just over two decades since Carson Valley Meat Co., was torn down to make way for Chichester Estates. Since then ideas such as a mobile slaughterhouse have been

The Record-Courier

90 Douglas County's Hometown Newspaper since 1880 Saturday, November 9, 2019

Slaughter house appeal Wednesday

by Kurt Hildebrand
khildebrand@recordcourier.com

During the flood of 1955, lifelong Centerville resident Julian Larrouy said he helped Roy Storke move all his dairy cows onto Centerville Lane because it was the highest spot.

Larrouy moved to Centerville as a 9-year-old boy and has lived on one corner or another ever since.

A former federal water master, he's seen the Storke dairy inundated by water.

While several southern Carson Valley residents claim to be neighbor, Larrouy and Kristin Miller both actually live next door to the location proposed for a meat processing facility at 876 Centerville Lane.

On Wednesday, Douglas County commissioners are scheduled to hear an appeal of the planning commission's denial of a special use permit to establish a meat processing facility.

APPEAL, 6

IF YOU GO

What: Douglas County Board of Commissioners
When: 1 p.m. Wednesday
Where: CVIC Hall, 1602 Esmeralda Ave., Minden
Info: www.douglascountynv.gov

Record-Courier

o. 92 Douglas County's Hometown Newspaper since 1880 Saturday, November 16, 2019

County denies slaughterhouse appeal

by Kurt Hildebrand
khildebrand@recordcourier.com

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Bently Ranch Manager Matt

SLAUGHTERHOUSE, 4

KURT HILDEBRAND

Residents sign up to speak at tables set up in Minden Park, where around 60 people listened to a hearing on a slaughterhouse at Centerville.

Processing plant is a slaughterhouse

The proposed Walker River Meat Processing Plant in Wabuska is just a fancy name for a slaughterhouse.

They also say they will use 1 million gallons of water a day. Where is all that water coming from?

Correct me if I'm wrong, but aren't we a desert state?

CHARLES L. SHELDON
Dayton

Advocates fear slaughter of mustangs

BY SCOTT SONNER
The Associated Press

RENO — State agriculture officials have discussed ways to muster support for the slaughter of stray horses in Nevada, and the discussions stirred protests among advocates for the free-roaming animals.

Wild horse supporters plan a rally at the state Capitol today to urge Gov. Brian Sandoval to call off next week's scheduled auction of 41 wild mustangs they fear will end up at a slaughterhouse.

"The people who frequent these auctions are kill buyers," said Carrol Abel, director of the Hidden Valley Wild Horse Protection Fund. "There is no reason these horses need to go out and be exposed to the slaughterhouse line."

Newly disclosed state records show members of the state Board of Agriculture have discussed ways to build public support for slaughtering stray horses that roam the foothills southeast of Reno.

The board discussions more than a year ago were prompted by concerns about the safety of motorists on state highways where the animals increasingly are struck and killed.

Nevada is home to about half of all free-roaming horses in the West.

The mustangs in the Virginia Range are considered state property and do not enjoy the same protections as those on adjoining federal lands under the Wild Free-Roaming Horse and Burro and Preservation Act.

Minutes of a meeting of the state agriculture board in late 2011 make it clear that Agriculture Director Jim Barbee and board members are sensitive to the political and emotional ramifications of selling the animals for slaughter.

In fact, one member who also serves on a federal advisory panel on wild horses suggested in December 2011 they might avoid some regulatory roadblocks by trying to place any new slaughterhouse on U.S. tribal lands, according to the minutes of the meeting on Dec. 6, 2011.

"Think looking at putting facilities on Indian reservations, which takes Legislature and everybody out of the equation," said Dr. Boyd Spratling, an Elko County veterinarian and co-chairman of the U.S. Bureau of Land Management advisory board, according to the minutes.

Charlie Frey, another board member, asked Barbee whether he discussed with Sandoval the possible slaughter of horses and whether he thought the public perception of slaughter had changed.

"I think it is something for the general public to consider in view that overseas some of that meat is (a) real good delicacy," Frey said, according to the minutes.

Wild horse advocates who requested the minutes from the Agriculture Department and provided a copy to The Associated Press plan to deliver more than 1,500 letters to Sandoval on Friday urging him to stop removing the horses from the range.

They specifically want him to cancel the scheduled sale of 41 Virginia Range horses at an auction in Fallon on Wednesday.

Sandoval's press secretary Mary Sarah Kinner did not immediately respond to requests for comment. Neither did Spratling or Frey.

More than three dozen horses have been hit since summer on three rural highways in Lyon and Storey counties around Silver Springs and Virginia City.

"We are damn lucky nobody has gotten killed," board member Ramona Morrison said on Thursday.

Barbee said to his knowledge, no Nevada horses sold in previous auctions have gone to slaughter, but he acknowledged there are no rules or regulation prohibiting that from happening with regard to state strays or feral horses.

"Most of them are bought by advocate groups," Barbee said. "These are not wild horses under federal jurisdiction. These are feral or stray horses. You've got to understand the only reason we are picking up horses is the public safety issue."

Until this summer, the state made the horses available to advocacy groups for purchase before proceeding to public auction. But Barbee said that policy was suspended in August after one group re-released the animals to the range in violation of the sales agreement.

Barbee downplayed the possibility of a slaughter facility being built in Nevada and said he was not aware of anyone considering such action.

He said the matter came up because Congress had removed from an annual appropriation bill a mechanism that effectively prohibited any horse slaughterhouses in the U.S. by withholding money required to fund USDA inspections required for such a facility to operate legally.

"Horse slaughter has never been technically illegal in the U.S.," Barbee said.

A New Mexico meat company has applied to the U.S. Department of Agriculture for a permit to resume domestic horse slaughter for food for the first time in five years.

There is no such thing as a "Mary Poppins" slaughterhouse...

A California company is proposing to build a slaughterhouse in Gardnerville at Hwy 88 and Centerville Lane, and is looking to get a Special Use Permit to circumvent current zoning laws.

Carson Valley has some of the best water in the country, and this slaughterhouse could have a direct effect on the quality of that water. Toxic effluents, blood, hide and hair from the slaughterhouse could reach our flood plain, river, streams, irrigation canals, ground water and impact some of the 5,000 domestic wells in the valley. The Carson River flows north into Carson City and Dayton, and our communities would be adversely affected by the terrible smell of rotting carcasses plus the nuisance and health risks of rats and flies that a slaughterhouse would attract.

Douglas County zoning specifically excludes slaughterhouses in areas zoned for agriculture. Slaughterhouses are considered industrial, not agricultural, and the environmental impact this would have on Carson Valley would affect the water and air quality we have all come to love. The Food and Agricultural Organization indicates that a slaughterhouse should be located in areas where flooding is ***impossible*** and be situated away from residential areas.

We encourage you to attend a special meeting for the Board of County Commissioners

Wednesday, November 13 | 1:00pm | CVIC Hall | 1604 Esmeralda Ave | Minden

This special meeting is for the BOCC to hear the appeal of the Planning Commission's decision to deny a request for a Special Use Permit to operate a meat processing facility in the A-19 zoning district.

From: Heather Ferris
To: Christie Overlay
Subject: FW: Slaughterhouse on Highway 50 East
Date: Monday, September 27, 2021 1:26:00 PM

Please include in late material for item 13E.

-----Original Message-----
From: Sue <farnhamsue@yahoo.com>
Sent: Monday, September 27, 2021 12:19 PM
To: Heather Ferris <HFerris@carson.org>
Subject: Slaughterhouse on Highway 50 East

Heather,
I would like to voice my concerns against the proposed slaughterhouse on Hwy 50 East. I realize this is a business of necessity but something of that nature is not acceptable inside city limits and placed very close to residential neighborhoods and other businesses. Douglas County has the need for this facility yet they couldn't get approval there, this should not be dumped on Carson City. Carson Valley Meat should find somewhere that is away from urban areas and not so much "in the face" of townspeople. Carson City is working on making our city a beautiful place and one that people want to visit, I don't believe a slaughterhouse is a welcoming sight for the east entrance to the city. Please consider not allowing this business to locate to their proposed location. Thank you.

Respectfully,
Susan Farnham
1753 Empire Ranch Road
Carson City, NV 89701
775-225-5098

Sent from my iPad

From: Roger Ingram
To: Planning Department
Subject: Support Email for Karin Sinclair, Carson Valley Meats, Agenda Item 13E LU-2021-0308
Date: Monday, September 27, 2021 1:46:24 PM

Dear Carson City Growth Management and Planning Commission,

I am writing this email in support of Karin Sinclair's proposal to build a harvest and processing facility for Carson Valley Meats. I have worked with Karin Sinclair since 2006 in my role as a Farm Advisor for the University of California Cooperative Extension. Karin has direct marketed her meat from livestock she raises in the Sierra Nevada Foothills since 2008. She helped with the formation and implementation with the Sierra Nevada Meat Buyers' Club in 2008 which featured online ordering and delivery to central locations . She became the owner/manager in 2011 and has now implemented the same approach in Nevada.

Karin is a strong supporter of agriculture. She is a person who "walks the talk" and does what she says she will do. She passionately cares about youth in agriculture and has livestock auctions from fairs in Nevada and California. She was a great 4-H project and community leader for many years in California.

Karin is a person of integrity who will do everything in her power to make this a successful project that fits in with the community.

The proposed project addresses concerns expressed through public comments from a prior application of 2019. The project is located in general industrial. The ability to hook into public water and sewer is a huge plus for the project. The applicant will ensure procedures to eliminate any odors and will provide excellent sanitation. The lack of USDA inspected slaughter and processing facilities has hampered local ranchers in being able to have the option to market meat direct or wholesale. Most existing facilities cannot accommodate service demand and are often scheduling a year in advance. This facility will provide ranchers in the Carson Valley area the ability to provide local meat to the area.

I would like to again urge the approval of the special use permit to benefit local agriculture. Please contact me with any questions.

Thanks,

Roger Ingram

UCCE Farm Advisor Emeritus
530-401-034