RESEARCH WATCH January 2008

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BEEF CATTLE

TOUGH STEAKS BEGIN AT THE RANCH

http://cattletoday.com/archive/2007/October/CT1224.shtml
by: Heather Smith Thomas

During the past 10 years, studies at universities have looked at the correlation between "wild" tempermental cattle and poor performance -- less feed efficiency at the feedlot, poor carcass quality (less tenderness, more dark cutters), etc. For a long time in our industry, disposition/temperment was thought to be just an inconvenience at the first level of production -- a hazard for the cow/calf producer. The fact that some cattle are harder to handle at the ranch was not considered a problem for the feeder or the end product -- affecting carcass quality or the consumer. Many seedstock producers didn't pay much attention to

this factor (concentrating on more tangible traits like weaning/yearling weights, birthweight, marbling), thus perpetuating the problem of unruly cattle.
"Wild" cattle are a product of a combination of genetics and handling. The natural temperament of any animal is inherited, but temperament/disposition is also influenced by the way we handle that animal. A nervous, flighty individual can often be calmed and become managable--with patient, quiet, careful handling, and an aggressive cow can learn to respect you if handled with quiet firmness.

Cattle can learn to trust and tolerate people and "fit the program" if handled with understanding and gentleness, or consistent quiet fearlessness--if they are smart enough to be trained. Some never do gentle down, however, and are a frustration or a hazard every time you handle them. Genetics dictates how well an animal will respond to the way it is handled. On the flip side, a naturally mellow individual can be made wild and untrusting by inconsiderate "cowboying."

The basic nature of an animal will generally surface during times of psychological stress or novel experiences. Even if you handle flighty cattle gently and they've become very managable and at ease with you, they may regress to their wild, untrusting natural attitude when confronted with something completely new or when handled a different way by someone else. One way to ensure easy-handling cattle that perform optimally on down the line is to start with genetically mellow cattle and then take care to handle/train them carefully so they are not "ruined" by fast gathers, barking dogs, shouting and hot shots at the chute. Quiet, consistent handling at the ranch will produce animals that perform better in the feedlot.

Gainability And Feed Efficiency -- The first studies looking at how temperament and cattle handling affected beef production were done in the mid 1990's by Dr. Temple Grandin, Colorado State University. She looked at the impact of temperament on an animal's ability to gain weight. Grandin and her research team studied 479 steers and heifers at two feedlot facilities in Fort Collins. This group of calves included a broad mix of breeds: Angus, Angus-Tarentaise cross, Brahman-Red Angus-Senepol composite, Braford, Simmental-Red Angus cross, Red Brangus, and Simbrah.

A temperament ranking was given to each individual, based on a 1 to 5 scale, after evaluating them in a squeeze chute or on a weighing scale. The rankings were 1. no movement; 2. slightly restless shifting; 3. squirming and occasional shaking of the restraint device; 4. continuous vigorous movement and shaking of the restraint device, and 5. rearing up, twisting or violent struggling, going berserk.

All cattle were fed to about the same finish (fat thickness of 9 to 13 mm over the 12th rib, aiming for a target thickness of 11 mm) as determined by periodic ultrasound measure. "We found the craziest animals (temperament score 5) had

the lowest average daily gain. Conversely, the calmest animals had the highest average daily gain," said Grandin.

Most of the cattle in this study had lower average daily gains than expected for their breed, and she attributed this to the fact that most of them were extremely wild and difficult to handle and had been brought in from ranches where they had minimal contact with people. They were not accustomed to being handled and had not been "trained" to trust people. Even though the number of highly agitated wild cattle was higher than their breed average, the comparison between the calmer and wilder individuals remained constant.

In later studies a "flight time" test was utilized to help determine temperament score. This looks at how fast the animal covers a certain distance after being released from a chute or any other restraint. Motion detection devices clock the animal's speed coming out of the chute. This "exit speed" is an objective way to measure the animal's excitability and tolerance to handling. The wildest animals leave more quickly. The longer it takes for an animal to leave the area on its own, the more docile it is. In studies at Texas A&M, for instance, exit speeds of weaned steers ranged from 0.4 feet per second (very slow and docile) to 13.5 feet per second (very wild). This flight-time test is considered to be a more accurate measure of temperament than the chute test, since the amount of struggling an animal does in a squeeze chute may not always relate to its behavior in a feedyard.

In 2003, researchers at the CSIRO Livestock Industries' Rendel Laboratory (Rockhampton, New Zealand) found that docile cattle had higher levels of productivity and overall carcass quality. The aggressive, wild cattle had lower average daily gains, poorer feed efficiency and lesser carcass weights. Dr. Heather Burrow, head of the research lab, said that poor temperament reduces profitability of cattle through increased production costs as well as poor performance. These cattle take more labor to gather and work, are harder on facilities, and increase the risk of injury -- to the cattle and to the people handling them. Using the flight-time test, Burrow said that crossbred steers with slow flight times (docile temperament) grew faster and had heavier carcasses than steers with poor temperament. "Steers with the slowest flight times gained 0.8 pounds per day more than steers with the fastest flight times," said Burrow. In addition, the research showed that good temperament reduces losses associated with transportation, reducing shrink losses as much as 60 percent.

In studies at Texas A&M in 2002, the difference between calm animals and wild ones was dramatic. In the first 50 days after weaning, those with wild temperament did not gain weight at all, while those with good temperament continued to gain weight as if they were still nursing their mothers. The wild steers ate less and lost an average of 11 pounds and the docile ones showed an average gain of 30 pounds during the first 50 days post weaning. This study was a cooperative effort between the Texas Experiment Station and University of

Georgia, using Angus and Braford calves. These results show that even if a set of wild calves weans at a good weight, whoever buys them may lose money; those calves are going to be more expensive to feed out.

Dark Cutters -- Poor temperament leads to poor meat quality. Wild cattle, or any animals that are upset at the time of butchering, tend to produce darker meat which has a shorter shelf life. The main cause of dark cutters is low muscle glycogen at the time the animal is butchered. The meat also has less than normal amount of lactic acid development (which occurs after rigor mortis sets in following slaughter), preventing a drop in the pH of muscle tissue. The pH of muscle tissue at slaughter is usually about 7 and drops to 5.5 to 5.6 after death, which is the desired level for good meat. Dark cutters are sometimes referred to as high pH beef.

Stress is the main cause of glycogen depletion in the muscles of cattle. This can be due to physical stress (strenuous activity) or pyschological stress (fear, anxiety). Either type of stress creates higher levels of adrenaline production in the body. These stresses can be due to many things--sudden weather change, how cattle are handled (getting them upset and fearful), mixing different groups of cattle (creating social stresses in the herd), poor temperament (which accentuates reactions to any other stresses) and so on. Wild, crazy cattle that tend to stress easily are much more likely to have poor carcass quality. Dark cutters generally result from stress or sickness incurred during transport to the packing facility, and these carcasses are usually discounted greatly or condemned -- resulting in a huge loss to the feeder.

In Temple Grandin's studies at CSU she looked at the effect of temperament on dark cutters, adding more cattle to her original weight gain study group, plus additional data on Angus, Hereford, Hereford cross and Tarentaise-Angus cross cattle. The results showed that cattle with the wildest temperament had the highest incidence of dark cutters; 25 percent of cattle with a score of 5 (wildest) were dark cutters, while less than 5 percent of those in the 1 to 4 ranking were dark cutters. Her research also found that heifers with wild temperament were more likely than steers to be dark cutters. Heifers, due to estrus activity--and bulls, due to testosterone--produce more dark cutters than steers.

The New Zealand studies found that docile cattle have 75 to 85 percent less dark cutters than wild cattle. Dark cutters are most often the result of disposition. If a calf is highly exciteable (due to being genetically predisposed toward flightiness, or from being treated roughly and becoming afraid of people), any stress from being handled may increase the likelihood of that animal becoming a dark cutter.

Tenderness -- The research in New Zealand looked at differences between docile and flighty, aggressive cattle, and found that the latter produced tougher meat. "Flighty cattle don't have enough glycogen [in the muscles], a sugar that helps break down the muscle after slaughter," said Dr. Burrow.

The Warner-Bratzler shear force test is often used to measure tenderness, registering the amount of force it takes to cut the meat. For testing, 1 or 1/2 inch cores are cut from steaks and inserted into the WBS machine, where they are sheared by a mechanically driven blunt knife. The force required to cut through the core is measured in pounds or kilograms. In the New Zealand research, cattle with good temperaments showed a 2.25 to 3.5 pound decrease in the amount of force needed to cut through certain cuts of beef, compared with meat from wild cattle. This decrease in shear force makes the difference between a piece of meat being tender or tough.

The U.S. Meat Animal Research Center (MARC) defines the acceptable tenderness threshold at about 1.8 pounds of pressure. Beef can be considered tender enough for pleasant eating if it's up to about 2.5 pounds of pressure, but anything higher than that is considered tough. In studies in the U.S. and other countries, it's been consistently shown that beef from docile animals takes less force to cut, with most of it being at or well below the 1.8 pounds of pressure. Wilder animals produced tougher meat, in some instances requiring 3 to 3.5 pounds of force.

The first U.S. research on tenderness was done in 2004, as a cooperative study between Texas A&M and Mississippi State University. Dr. Ron Randel (Texas Ag Experiment Station, Overton) said the correlation between high exit speeds (leaving a chute) and toughness was substantial. Earlier work done by Randel and other Texas A&M researchers showed that wild cattle eat less and gain less, but this study was the first in the U.S. to show a strong correlation between temperament and meat tenderness. All the animals with high WBS scores (moderately tough to very tough) had high exit speeds (averaging about nine feet per second) on their temperament tests.

Genetic Selection -- The cow-calf producer is where it all starts. We need to diligently select cattle for good temperament in our breeding programs, not just to make life easier for ourselves when handling them but also to ensure more profitability. Feeders are learning that gentle cattle perform better, and in the future this may be one of the criteria that determines whether or not they'll want to buy your calves. Gentle cattle are just more profitable all down the line. They are easier on facilities, less hazard to the people working with them, and easier on themselves (less injuries and bruising). Wild cattle are not only apt to injure themselves, but also seem more susceptible to some diseases--since stress can hinder the immune system.

Some breeds are considered more wild and crazy than others, but it's a mistake to make generalizations since there are "hyper" individuals in every breed. Just because an animal is of a certain breed that's traditionally noted for being docile does not mean the individual will be docile. There are family lines in every breed that are more wild than others. Disposition is something we always need to keep

in mind when making breeding decisions, whether we are raising Herefords or Brangus. In the past, selection for good disposition has not been a high priority for many seedstock producers, since this was not a quantifiable trait like birth weight, weaning weight, yearling weight, etc. As a result, we've often perpetuated wild or difficult-to-handle cattle.

A wild cow or bull is likely to produce offspring with the same crazy attitude. Disposition is highly heritable. Even if a cow or bull produces calves with other desirable traits, this one bad aspect can spoil it all and should not be tolerated. In a herd situation, one wild, suspicious or crazy cow can influence the others and raise the stress level of the whole herd when you try to gather them or work them. One suspicious cow that runs off when you approach will make the others think there is something to be afraid of, since herd animals take their cues from herdmates.

Dr. Burrow in New Zealand said that selecting for disposition should be done soon after weaning, when the animals are somewhat familiar with the handling facilities, but not yet so familiar that their natural behavior has already been modified. "Comparative flight times (when leaving a chute) can be used to identify the ones that will perform well under intensive production and handling systems, including feedlots," said Burrow. She urged feedlot operators to use flight times also--as a management tool as cattle enter the feedlot. This could help them decide which aniamls should be penned together, and which should be culled or put into lots with similarly wild cattle, so they won't be a bad influence on the gentle ones.

Tips On Handling Cattle -- Handling cattle is like training horses. It should always be done with forethought and consideration of the repurcussions -- how the animal will react to your actions (now and in the future). Everything you do cattle either makes them better (more trusting, more easy to handle the next time) or worse. The way you handle cattle can make them less trusting, more likely to run off when they see you coming, more reluctant to go into the corral, more apt to balk at going down the chute, more frantic in the chute, more desperate to get out of it, more apt to run over you if you are in their escape route, etc.

It is important to instruct work crews to handle cattle slowly and quietly, rather than rushing to get the job done quickly. Haste never pays; it results in banging and bruising of cattle, risk for human accidents, noise and action that increases stress level of the whole herd and a domino effect, with all the cattle becoming more fearful to enter the sorting corrals or working facility -- and more reluctant to go through it the next time. This creates a vicious cycle, with cowboys using more noise and more forceful methods. It's also very typical that even if the day starts out with slow and careful handling, people tend to revert back to hurrying, poking and prodding and ramming and jamming the cattle as the day progresses. Training your work crews is part of training the cattle. The animals won't have a

good experience if the people handling them can't change their traditional ways of working cattle.

It is very important that young cattle be handled properly, so they will be more docile and managable later -- either in the feedlot or as replacement heifers and cows. Their first experience with people and being worked should be a good one. A bad experience the first time they are put through a chute, for instance, can create a permanent bad memory and make future working more stressful. Stress is one of the hidden costs of cattle production. The stress of being worked affects weight gain, reproduction and health of the cattle. Calm, quiet handling always pays. If you are upset or in a hurry when you work cattle, the animals can sense your mood and this makes them more upset and stressed. Noise, extra movement, etc. can get cattle excited and they are harder to work. Move slowly and deliberately around cattle; sudden movements are more apt to spook them. Several studies have shown that cattle can become very fearful and agitated in just a few seconds of bad handling, but it may take 20 to 30 minutes for their heart rate to return to normal after a bad experience. It's better to try to avoid this kind of stress to begin with.

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Blood Test Could Help Farmers Detect Stress In Cattle
CBC News Online
December 20, 2007

Researchers at the University of Saskatchewan have developed a blood test to detect stress in cattle - with the promise it could give farmers a heads-up about whether their animals will get sick. In a study on cattle, the researchers at the university's Vaccine and Infectious Disease Organization found that psychological stress and physical stress cause detectable changes in blood proteins and other blood compounds. They believe such "biomarkers" can then be used to predict diseases like stress-related bovine respiratory disease, which causes more than half of feedlot deaths. The hope is that once the problems are identified through the blood test, veterinarians can treat the animals. The study was published this week in Omics: A Journal of Integrative Biology.

Some cattle producers say they welcome the development. "If it leads to better vaccines that respond to cattle under stress . I can see it being very useful," said Alvin Pawlitza, who raises purebred Hereford cattle on his farm near Abby in southwestern Saskatchewan. But Dennis Fugelrud, president of the Saskatchewan Stock Growers Association, said while a blood test is a good tool to have, its effectiveness will depend on how practical it is to use and how much it costs. "There isn't a lot of room for many extra costs in our business," he said, "especially with this downturn in prices that we have seen in the last several months."

According to researcher Palok Aich, the findings could also help farmers change their management practices to reduce animal stress. It's possible that the research could someday be adapted to detect stress in humans, he said.

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Methods for Cold-stressed Newborn Calves
December 19, 2007
Cow Calf Corner, OK State University

Recently an Oklahoma rancher called to tell of the success he had noticed in using a warm water bath to revive new born calves that had been severely cold stressed. A quick check of the scientific data on that subject bears out his observation. Canadian animal scientists compared methods of reviving hypothermic or cold stressed baby calves. Heat production and rectal temperature were measured in 19 newborn calves during hypothermia (cold stress) and recovery when four different means of assistance were provided. Hypothermia of 86o F rectal temperature was induced by immersion in cold water. Calves were rewarmed in a 68 to 77o F air environment where thermal assistance was provided by added thermal insulation or by supplemental heat from infrared lamps. Other calves were rewarmed by immersion in warm water (100oF), with or without a 40cc drench of 20% ethanol in water. Normal rectal temperatures before cold stress were 103 oF. The time required to regain normal body temperature from a rectal temperature of 86oF was longer for calves with added insulation and those exposed to heat lamps than for the calves in the warm water and warm water plus ethanol treatments (90 and 92 vs 59 and 63, respectively). During recovery, the calves rewarmed with the added insulation and heat lamps produced more heat metabolically than the calves rewarmed in warm water. Total heat production during recovery was nearly twice as great for the calves with added insulation, exposed to the heat lamps than for calves in warm water and in warm water plus an oral drench of ethanol, respectively.
By immersion of hypothermic calves in warm (100 oF) water, normal body temperature was regained most rapidly and with minimal metabolic effort; no advantage was evident from oral administration of ethanol. When immersing these baby calves, do not forget to support the head above the water to avoid drowning the calf that you are trying to save.
Source: Robinson and Young. Univ. of Alberta. J. Anim. Sci., 1988.

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Detecting cattle disease before physical signs appear
21.dec.07
From a press release
KANSAS STATE UNIVERSITY

Early each morning after feeding, "cowboys" Marc Epp and Rodney Derstein take a spin through the cattle pens at Kansas State University's Beef Stocker Unit. Epp, the unit's manager, is looking for signs of sickness -- and he's got a pretty good eye. "Sometimes they don't feel like eating, they hold their head down. Or they might be having a hard time getting around," Epp said. "You can just tell by paying attention to their mannerisms." Once they're spotted, the potentially ailing calves are brought into the unit's processing center for an in-depth examination. The sooner a sick calf is treated, the quicker it recovers. But when Epp pulls a calf with borderline signs of sickness, he sometimes thinks twice. Visual identification, after all, isn't an exact science. "In some cases it's just a judgment call based on your experience," he said.

Thanks to research taking place at K-State's Beef Stocker Unit, modern-day cowboys could soon be using a bit of old-fashioned science to fight disease in the feedlot. Dale Blasi, a K-State professor of animal sciences and industry, is researching the effectiveness of a new radio-frequency identification ear tag that takes the animal's temperature. Elevated temperature is thought to be a precursor to the onset of disease.The experiment is taking place at the Beef Stocker Unit, which is designed to emulate real stocker cattle receiving conditions in the interest of research. It is also home to the K-State Center of Excellence for Animal Identification, where researchers examine whether certain technologies have an economic benefit for producers. Blasi says what comes into the typical receiving yard is a mixed bag. The animals come from several farms and are typically stressed, having been on a semitrailer for as many as 14 hours. Exhaustion and dehydration aren't wholly uncommon, which leaves calves particularly susceptible to disease.

Depending on what's ailing a particular calf, signs of sickness can range from the withdrawal of feed to subtle behavioral changes And, you've got to know what you're looking for. Sometimes, Epp says, labor is short and the pen riders on the larger feedlots can be inexperienced. The tag, which is manufactured and marketed by a company called TekVet, looks like a traditional plastic identification tag, except that it has an active, battery-powered radio frequency transmitter attached to it. The tag goes on the animal's left side and has a flexible thermometer that slides down the ear canal next to the tympanic membrane. The thermometer periodically takes the calf's temperature and transmits the data to a dish located in the feed yard. The dish then transmits the temperature data to tracking software developed by the same company. Blasi said that the software can be set by temperature - normal for a cow is in the 100-102 degree range - to alert lot managers of an elevated reading. This gives workers who do visual inspections a heads up on which cows might be sick.

Blasi calls the technology a management tool to give the feedlot manager one more way to fetter out sickness in the herd. While it seems to be working well, Blasi said there's still a lot to learn. The unit just received the second set of calves for the research trial."We're evaluating the importance of this technology

for early disease detection," Blasi said. "We want to be able to administer the antibiotic based on the true need of the animal." Early findings have revealed some difference in the way calves reacted to different antibiotics. More findings are anticipated. The trials will continue throughout 2008.

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Research shows feedlot deaths on the rise
By Jeff DeYoung, For Farm & Ranch Guide
Friday, December 7, 2007

With advances in feedlot management and improved health care, Rodney Jones says it's only logical to believe feedlot death loss has decreased. However, recent research may indicate otherwise. “What we saw with the cattle we looked at in the Southern Plains feedlots was a slight but significant trend toward increased death loss,” says Jones, an Extension ag economist at Kansas State University.

The research, led by graduate student Abe Babcock, looked at Kansas feedlots from 1992 to 2004. Jones says the study was designed to determine if there was any death loss trend, if any increase was gender-based and to evaluate if lighter weights had any effect on the death loss. “We've seen some lighter calves heading into the feedlots in recent years due to dry weather, so we wondered if that might have something to do with the increase,” he says. He says the data indicated while placement weights had no effect on steer death loss, it did increase heifer losses. “While we did find that death loss increased overall, it was interesting to see that placing calves at lighter weights did have an impact on death loss with heifers,” Jones says.

KSU began collecting weight loss data in 1992 in its “Focus on Feedlot” report. Jones says researchers used sample data from eight Kansas feedlots with numbers reported at closeout. Those numbers included final weight, average days on feed, average daily gain, dry matter feed conversion, percentage of death loss, average cost per hundredweight of gain, projected cost of gain for replacement cattle, and corn and alfalfa prices. Jones says the data indicated death loss in the feedlot was increasing by 0.0467 of a percent per year. For heifers, that number was 0.0672 of a percent. “Like I said, it's very slight, but it is a definite trend,” he says.

Jones says each 1 percent increase in placement weight should result in a 0.050 of a percent decrease in death loss. I think you need to be careful when bringing in heifers because this does show they may struggle more than steers,” he says. Seasonal issues may also cause more harm to heifers than steers. Jones says the research indicated heifers may have a greater risk of death with late-spring closeouts. “We did have some severe weather in the spring of 1993, and you really saw a huge impact on heifers,” he says. “It shows you may not be able to

place light heifers in the fall to close out in the spring or, if you do that, you may want to figure in that increased death loss percentage when you price those calves."

Jones says there could be several reasons for the increase in death loss, despite the improvements in management and medical technology. "I think we continue to push cattle to the limit when it comes to feeding, and that could make them more likely to succumb to illness in the feedlot. "Or, it could also be that we do a much better job keeping cattle alive prior to them being placed in the feedlot. "If a calf is sick and recovers, it is probably going to be more likely to have problems down the road. We kept that calf alive when it was younger, only to have it die in the feedlot." Jones says additional research will be needed before all those questions are answered.

"I don't know that anyone thought we would see a significant death loss trend, but we have. And, it's something we really need to look into further." The numbers should be part of the equation when feedlots are bidding on cattle, Jones adds.

"We know heifers are going to struggle more than steers when they have lighter placement weights. "We know heifers that are placed with a spring close out in mind are going to struggle. I think we need to take these numbers seriously and keep them in mind when we are buying cattle."

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DAIRY CATTLE

Bedding type affects cow welfare
Management, not farm size, influences cow welfare and longevity.
(10/15/2007)
TEMPLE GRANDIN*
Feedstuffs Magazine

**Temple Grandin, a leading animal welfare scientist, is with the department of animal sciences at Colorado State University.*

A SURVEY of 113 freestall dairies in five midwestern and eastern states indicates that careful management of the freestall bedding surface will greatly reduce swellings and injuries to the hocks. This study was conducted by Wendy Fulwider. She collected data on hock lesions, cow cleanliness, freestall dimensions and bedding management practices. The size of the farms ranged from 80 to 4,286 cows.

The Table shows the dramatic difference between the top third best-managed dairies and the bottom third worst dairies on the percentages of cows with

swellings on the tarsal joint. Dairies where the bed surface was carefully managed had significantly fewer cows with lesions.

Good management of freestalls prevents swollen joints on dairy cows		
Stall bed type	**Avg. cows with tarsal joint swelling, %**	**Significance**
Rubber foam mattress beds		
Worst 1/3 dairies	27	
Best 1/3 dairies	4	P < 0.0001
Sand beds		
Worst 1/3 dairies	5	
Best 1/3 dairies	0	P < 0.01
Water beds		
Worst 1/3 dairies	9	
Best 1/3 dairies	1	P < 0.0001

The bedding types surveyed were rubber-filled mattresses, sand and water beds. All results were analyzed with the dairy farm as the experimental unit. The best practices that reduced leg lesions were frequent addition of fresh bedding in the rubber mattresses and water bed stalls. The dairies with the lowest percentage of cows with lesions added sawdust or other bedding either every day or every other day. Dairies with higher percentages of lesions bedded once or twice per week. On dairies with sand-bedded stalls, keeping the stalls filled was essential to prevent injuries caused by the legs rubbing on the rear concrete curb. Dairies that used coarse recycled sand had a higher percentage of hairless knees. Hair loss was much lower when fine-grain sand was used.

Effect of bed type

When the bed types were compared, the cows on the rubber-filled mattresses had significantly more lesions than the cows on sand or water beds. The percentage of cows with swellings of up to 7.4 cm in diameter was 14% on rubber mattresses, 2.3% on sand and 5% on water beds. The difference between the rubber mattress stalls and the other two bed types was highly significant ($P < 0.0001$). The type of bedding also had an effect on cow cleanliness. Cows on the rubber mattress and water beds were significantly cleaner then cows housed on sand. The percentage of cows soiled with manure on the legs and udders were: 15.27% on rubber mattresses, 23.8% on sand and 18.6% on water beds.

Cow health

Cows with the most severe lesions -- with swellings of more than 7.4 cm in diameter -- had significantly higher somatic cell counts. Cows housed in rubber mattress stalls that were too narrow had higher somatic cell counts. Stall

dimensions had no significant effect on somatic cell count for dairies that used sand and water beds. Bed type had no effect on somatic cell count when the three bed types were compared with no analysis by dimensions. This may be explained by the fact that none of the dairies in this survey used recycled manure or digested solids for bedding. There was a significant effect of bed type on culling rate. The percentage of fourth-lactation cows was greater on water beds compared to the other two bed types.

An overall conclusion reached was that dairies that had high levels of lesions had significantly higher somatic cell counts, death losses, lameness and culling rates. This survey clearly shows the importance of good management to improve the longevity and welfare of dairy cows.

Reference
Fulwider, W.K., et al. 2007. Influence of freestall base on tarsal joint lesions and hygiene in dairy cows. J. Dairy Sci. 90:3559-3566.

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Spacious transition pens
Dairy Herd Management
December 10, 2007
Moving calves from individual housing to group pens can be a traumatic experience for them. However, you can minimize the stress with proper housing, says Sam Leadley, calf and heifer management specialist at Attica Veterinary Associates, Attica, N.Y. For instance, provide at least 25 square feet of resting space per heifer. "If heifers are disturbed frequently — which happens with reduced resting space — heifer stress levels increase," he notes. "This stress is a precondition for illness and poor feed conversion efficiency." Also be sure that there is enough bunk space for all heifers to eat at once and that waterers offer easy access during all weather conditions.

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Weaning Challenge
Author: Tom Wright - Dairy Cattle Nutritionist/OMAFRA
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Get full benefit from those new labour-saving calf-feeding systems by taking a hard look at your weaning program. If you're thinking of introducing a labour-saving calf-feeding system to your operation, or if you've already taken the plunge, consider a weaning program evaluation as part of the package. This can help ensure that you reap the system's full benefits.

Computer-controlled feeders and low-cost free-choice systems using acidified milk or milk replacer are two examples of the newer technologies for feeding dairy calves. They have a lot of potential to save labour. These systems also offer the advantage of generally providing more milk to your calves than traditional rearing methods have offered. More milk gives calves a better chance to reach their full genetic potential for growth and enhances overall animal health.

European and North American researchers have recently published several studies showing that feeding more milk or milk replacer to calves increases rate of gain and results in fewer signs of hunger. In free-choice feed systems, calves have been reported to consume more than 12 litres of milk per animal per day. However, when weaning calves consuming high quantities of milk or milk replacer, you do face some challenges. A common pitfall is a decline in average daily gain during the week following weaning-as much as 50 per cent less than the week before weaning. This decrease is typically attributed to an inadequate intake of calf starter after weaning. While the benefits of accelerated milk feeding programs still outweigh this drawback, improved weaning management could help.

A recently published Danish Institute of Agricultural Sciences study examined weaning by giving calves either a high or low milk allowance and using two different weaning strategies. Calves were given eight litres a day or 4.8 litres a day of milk replacer. Individual calf starter intake was also recorded during the study. Weaning was done gradually from day 52 to day 68. The researchers weaned half the calves from the high- and low-quantity groups by reducing portion size but keeping the number of portions fed per day the same. Remaining calves in each group got the same portion sizes but fewer portions per day.

Before weaning, the low-quantity calves visited the milk feeder more often [44.3 versus 26.8 visits per day] than the high-quantity group and spent more time at it [51.1 vs. 41.5 minutes per day]. Calves on low-quantity milk feeding had many more trips to the feeder when they received no milk, likely reflecting their hunger for it. Low-quantity calves spent considerable time sucking the milk feeder with no milk coming out. These calves consumed more calf starter [463 grams versus 243 g per day] than the high-fed group. However, the low-fed calves had a lower average daily gain [657 g versus 737 g per day] than the high-fed group. Their higher calf starter intake did not adequately compensate for the reduced quantity of milk received.

There were few differences between the two weaning strategies used in this study. Calves had a tendency to spend less time at the milk feeder immediately after drinking when the number of milk portions was reduced but the total time spent at the feeder for all visits was the same for both

weaning methods. It's important to note that these researchers used only two weaning approaches. There's not enough evidence to say that these are the best or only ways to wean calves off high milk volumes. The Danish researchers recommend that you offer calves a higher quantity of milk because the calves are less likely to experience feelings of hunger. They will spend less time at the milk feeder than they will with a lower amount.

More studies will probably be published on weaning calves using various milk feeding systems. Some Ontario experiences have suggested that abrupt weaning may be necessary at times. Unfortunately, reduced rates of gain are still common immediately after weaning but they should not be excessively depressed from pre-weaning rates or last long. Monitor calf starter intake and rate of gain before and after weaning. Adjust your weaning program by altering milk portion number or portion quantity if you're not satisfied with the results you get.

Reference:
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Grooming Upgrade

Author: Mario Mongeon - Livestock Specialist/OMAFRA
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Given a choice, cows much prefer a mechanical brush to scratching themselves on walls or watering bowls. When you see your cattle rubbing themselves against water bowls, walls or fences, they are just doing what comes naturally. Grooming is a daily ritual for many farm animals and dairy cows are no exception.

About 20 years ago, dairy equipment manufacturers introduced mechanical brush-on-demand devices that help cows groom themselves. Since then, many new free-stall dairy barns have included mechanical brushes as part of the installed equipment. Cow brushes have been reported to be an environmental enrichment for cattle. They could improve overall cow comfort and help reduce boredom in the barn. Various types of brushes are available but their basic features are similar. A cow rubbing against one of these devices activates the rotation of the brush, powered by an electric motor. When the animal is finished, the unit turns itself off.

Recent research in British Columbia evaluated how a mechanical brush

affects the grooming behaviour of group-housed dairy cows. Researchers split a 72-cow herd into groups; each spent time during a control period without a brush and an experimental period with it. Using video surveillance cameras, researchers evaluated each animal's behaviour. During the control period, cows scratched themselves mostly on walls and water bowls. Each animal groomed herself an average of three times a day for a total of about one and a half minutes. Within the first day of access to the mechanical brush, more than half the cows were using it during the experimental period. After a week, most of the cows were getting themselves brushed. These cows cut the time in half that they would spend grooming on walls or water bowls but the time spent at the brush more than compensated. Each cow averaged almost seven minutes a day using the device.

Total scratching time for cows when they had access to the mechanical brush was more than six times greater than when they were without it, and the number of times they groomed themselves more than tripled. These findings suggest the mechanical brush allows the cows to express and better satisfy their need for regular, daily grooming. Introducing a mechanical brush to the pen not only increased the time and frequency of grooming but also changed the parts of their bodies the cows scratched. Head scratching accounted for 86 per cent of the total, with neck and thigh at 11 and three per cent, respectively during the control period. When the mechanical brush was available, the proportions changed. Although the head remained the main target 63 per cent of the time, the cows used the brush to scratch hard-to-reach places like their backs and tails 10 and nine per cent of the time, respectively.

Although cow cleanliness was not recorded during this trial, farm personnel involved with the project reported that cows appeared much cleaner when they had access to the brush. In an earlier study in the Netherlands, researchers reported that animals with access to a cow brush had cleaner coats that were also in better condition. As well, behaviour of these cows indicated less discomfort and frustration from itchiness compared to those without access to the cow brush.

These differences increased with time-a positive aspect that may encourage you to consider installing one of these devices in your barn.

Position brushes to optimize cow traffic.

If you decide to install a cow brush in your free-stall barn, careful positioning is a must to optimize cow traffic as well as brush use. In exercise yards, limited time spent in the yard by the cows may increase competition for the brush. You may need more than one unit, depending on herd size.

Ensure cows have excellent footing under the brush, even to the point of roughening the floor more than usual. Cows can contort themselves into

some pretty strange positions trying to scratch hard-to-reach places. They have been known to fall and injure themselves in the process if the floor is slippery.

Don't place brushes within eight feet of a water tank or along the feed manger. There will be lots of hair and dust dispersed in the area immediately around the brush and you don't want it to spoil water or feed quality.

Don't place the brushes in high traffic areas. They will definitely attract additional cows to an area and block normal animal movement. A crossover alley between the free stalls is usually the best choice. If it's at the end of the barn and there is no water trough nearby, placing the brush on the end wall will keep it out of the line of traffic. If there is a water tank, the inside of the turn may be the only option. In either case, a wider crossover of 16 to 20 feet is advised if you intend to provide a place for drinking and grooming as well as normal cow movement.

It has been demonstrated that dairy cows tend to increase their grooming behaviour following periods of restraint-grooming seems to be one of the first behaviours a cow does after being freed. It has been suggested that mechanical brushes could also be a desirable addition for exercise yards in tie-stall operations.

Reference:

Usage of Mechanical Brushes by Lactating Dairy Cows DeVries et al. Journal of Dairy Science. 2007; 90: 2241-2245.

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Programs aimed at providing assurances
Feedstuffs
October 15, 2007

Development another quality assurance program for animal agriculture is underway following a major launch at the recent World Dairy Expo. According to organizers, the National Dairy Animal Well-Being Initiative is led by a producer-based coalition representing every facet of the dairy industry and is aimed at protecting consumer trust and confidence in the dairy industry's commitment to animal well-being.

In unveiling its plans, the coalition said its program is "endorsed" by co-ops representing more than 25,236 farms and more than 104.1 billion pounds of milk marketed annually. Principles and guidelines for the initiative have been drafted and, over the course of the next year, will be moved to a more final format.

The National Dairy Animal Well-Being Initiative joins the ranks of other industry quality assurance programs, including those in place for the egg and pork industries and even an existing program for dairy and dairy beef animals. For dairy, the Milk & Dairy Beef Quality Assurance Center has operated a program called the 5-Star Dairy Quality Assurance (DQA) since the early 1990s aimed at addressing the handling of dairy animals as well as the care of the land and water around the dairy facility. At present, according to DQA executive director Keith Carlson, 2.5 million of the nation's 9 million dairy cows are part of the DQA program. Given the support the Dairy Farmers of America has given to the program, Carlson estimated that by the end of this year, some 4 million dairy cows will be included in the DQA program.

Carlson said, as with the 5-Star program, any quality assurance guidelines must be backed with solid university research. Likewise, Carlson said, he believes in the importance of involving veterinarians in the audit process. Carlson said food companies he works with have indicated that they favor veterinarian involvement because of their extensive knowledge of animal production and their advantage of regularly assisting with issues on farms. Veterinarians bring to the table seven years of training, they are licensed professionals

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Dairy cattle suffer less from lameness when reared organically
The Herald
October 20 2007

A Scottish Agricultural College (SAC) study has shown that the incidence of lameness is lower on organic dairy farms compared to non-organic farms. The lower incidence was associated with longer periods that the cows spent at grass and the higher age at which they first calve. The levels of hock lesions were also lower on organic farms.

The three-year study, sponsored by Defra at a cost of £300,000, compared 40 organic farms and 40 non-organic farms across Great Britain and assessed lameness, mastitis, ketosis, somatic cell counts, fertility and cow behaviour. Other than foot and leg health, there was little difference between the health and welfare of Holstein Friesian dairy cows on organic and non-organic dairy farms.

Organic farms have restrictions on the use of veterinary medicines and use of concentrate feed, but this does not appear to affect most aspects of health and welfare in the cows.

There was more competition for fresh feed among cows on organic farms with open feed-faces, indicating that they may be hungrier. However, there was no other evidence that organic cows might be nutritionally compromised, as there were no differences between organic and non-organic farms in the levels of

ketosis or in cow body condition.Farmers on the organic farms reported treating fewer cases of mastitis, but they also reported that they would often wait to see if a case would resolve itself rather than treating immediately, which was the most common practice on the non-organic farms.The study also compared levels of somatic cell count, calving interval, cow cleanliness, internal parasites and behaviour, but few differences were found.

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Give calves more light
The study results were published in the November 2007 Journal of Dairy Science.

Extra hours of light can increase milk production in cows and enhance growth in heifers. Now, research from the University of Guelph in Ontario, Canada, shows it also may benefit calves.Calves exposed to 18 hours of light, followed by six hours of dark (long-day photoperiod) were heavier at 56 days of age compared to calves given only 10 hours of light and 14 hours of dark (short-day photoperiod).

Average daily gain from 29 to 56 days of age was nearly three-fourths of a pound greater for the long-day calves versus the short-day calves. Long-day calves also ate about 4 pounds more starter per calf per day than the short-day calves. That, say the researchers, “stimulated faster rumen development” in these calves. During the study, the researchers used fluorescent lights to achieve a lighting intensity of about 600 lux at eye level.

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Calf-housing pen protocols
Dairy Herd Management Calf and Heifer Advisor
November 26, 2007

Sunshine Genetics, of Whitewater, Wis., maintains a calf death loss of less than 1 percent with Holstein and Brown Swiss calves born on-farm. That's especially important, given that all calves born here are high-value embryo-transfer calves. Karen Marsh, calf manager, says keys to success include the following calf-housing protocols:
All calves are raised in hutches placed 5 to 6 feet apart.
Hutches are placed on a gravel pad.
The hutches are rotated seasonally between three different gravel-pad locations. Each pad is cleaned following removal of calves and remains unused for three to six months.
New gravel is applied before calves return to the area.
Hutches, front panels and feed pails are washed and sanitized between each calf.

Absolutely no visitors are allowed in the calf-housing area. This includes employees who work in other areas on the farm.
Hutches are bedded with straw in winter and dry-wood shavings in summer.

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PIGS

Clinical Signs of Stress in Finisher Pigs Transported to Market in the Summer

By Janet Sunstrum, BSc; Cate Dewey, DVM, PhD; Charles Haley, DVM, PhD.
NC State Swine Extension. Swine News Volume 30, number 8.
September 2007

Introduction
A study conducted in 2001 in Ontario found that of 4,760,213 market weight pigs shipped to packing plants, 7969 died prior to being processed at theplant. Of those that died, 15% were classified as “subject” pigs when they were loaded into the truck.[1] A subject pig is one that appears abnormal for any of a variety of reasons. Pigs shipped in the summer months were twice as likely to die in-transit compared to pigs shipped during other months of the year. The objectives of this study were to describe the numbers of subject pigs and pigs dying intransit and the factors associated with these during the summer. Specifically, we recorded reasons for subject pig classification, clinical signs of stress as pigs were being unloaded, temperatures at the time of unloading, time spent waiting at the packing plant prior to unloading and the relationship between these variables and in-transit loss.

Materials and methods
This observational study included a weekly visit to the three largest packing plants in Ontario during July to September of 2003. Data were collected on 46,331 pigs from 250 trucks and detailed observations were made on 7351 individual pigs as they were unloaded at the plant. Specifically, every fifth pig unloaded for a maximum of 30 pigs per truck was scored for stumbling, panting, squealing, tail injury, and scratched skin. Time of arrival of trucks, wait time prior to unloading, number of pigs per truck and the number of subject and dead pigs on each truck was recorded. The reasons for subject classification, the locations where subject classification occurred and the locations on the trucks where pigs were found dead were recorded. Hourly dry temperature data was purchased from the government and merged with the other data to match the hour when pigs were unloaded. Poisson regression was used to determine the associations between panting, death and subject classifications, temperature at the time of arrival and waiting times at the packers.

Results and discussion

On average 0.27% of pigs were classified as subject. Of the 0.07% pigs that died in-transit, 34% were identified as subject prior to death. Subject classification occurred 6.1%, 30.4%, and 63.4% of the time at the producers, assembly/dispatch yard, and packing plant respectively.

The reasons for subject classification were as follows: pigs showing severe signs of heat stress (fatigued) (48.0%), lame (44.9%), prolapse (6.3%), intact males (3.1%), severe bruises (2.4%), head tilt (1.6%) and tail bitten (1.6%). In total, 7.8% of these pigs had more than one reason for the subject classification. Of the 7351 pigs observed 11.6% stumbled or fell, 5.4% panted, 4.5% squealed, 1.2% had injured (bitten) tails and 59.8% had scratches.

There were 38 pigs that died on the 250 observed trucks. The locations on the trucks where pigs were found dead were as follows: 46% bottom deck, 3% front middle deck, 15% back middle deck, 9% front top deck, 21% center top deck and 6% back top deck. Knowledge of the location on trucks where pigs are more likely to experience heat stress or die from heat stress may be used to alter stocking densities or implement cooling mechanisms in these areas.

During heat stress, pigs thermoregulate by panting and if their body temperature continues to rise they collapse and may die due to cardiovascular failure.[1] Trucks with at least one dead pig were 2.0 times more likely to have panting pigs than trucks without dead pigs ($P < 0.0001$). Similarly, panting pigs were 2.2 times more likely on trucks with fatigued pigs than on trucks without fatigued pigs ($P < 0.0001$).

Trucks waited to unload for an average of 49 minuteswith a range of 2 to 198 minutes. There was no association between the time waiting to unload at the packersand the risk of pigs panting. However, as the waiting time increased by 30 minutes, the risk of dying and the risk of being a fatigued subject pig increased by 2.2 and 2.3 times respectively ($P < 0.0001$). The outside temperature when the pigs arrived at the packers averaged 25°C and ranged from 19 to 31°C. As the temperature on arrival at the packers increased by 10°C increments, the risk of panting, dying or being a fatigued subject pig increased 2.3, 26.7 and 26.2 times respectively ($P < 0.0001$). Previous research on pig transport trailers in Ontario during the summer showed that when stopped, trailer temperature increased on average by 5.6°C. It took 56 minutes for the truck to reach its maximum temperature after the stop. The increase in temperature of the trailer while it was stopped ranged from 0°C to 25°C.[1] Thus, as time waiting to unload at the packers increased, the temperature within the truck would have increased. This rise in temperature may be responsible for the correlation between time waiting in the yard and the risk of death or being a fatigued subject pig.

Heat stress, as indicated by counting panting pigs, was a predictor of subject classification and death during transport. Shipping pigs during the cooler hours of

the day, implementing cooling mechanisms such as sprinkler systems (as observed at 2 of the 3 plants) and efforts to decrease wait times prior to unloading may help reduce loss due to heat stress and improve swine welfare.

Acknowledgments
The authors greatly appreciate the contributions of the cooperating packers and truckers and Karen Richardson for her assistance with data collection.
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Effects of distance moved during loading and floor space on the trailer during transport on losses of market weight pigs on arrival at the packing plant
Source: December, 2007, Journal of Animal Science

Effects of distance moved during loading and floor space on the trailer during transport on the incidence of transport losses (dead and nonambulatory pigs) on arrival at the packing plant were evaluated in a study involving 42 loads of pigs (average BW = 131.2 kg, SD 5.05). A split-plot design was used with a 2 x 6 factorial arrangement of the following treatments: 1) distance moved from the pen to the exit of the building [short (0 to 30.5 m) vs. long (61.0 to 91.4 m)] and 2) transport floor space (0.396, 0.415, 0.437, 0.462, 0.489, or 0.520 m2/pig). Loading distance treatments (sub-plots) were compared within transport floor space treatments (main plot). Pigs were loaded at the farm using sorting boards and, if necessary, electric goads, transported approximately 3 h to a commercial packing plant and unloaded using livestock paddles.

The number of nonambulatory pigs during loading and the number of dead and nonambulatory pigs at the plant were recorded. Nonambulatory pigs were classified as fatigued, injured, or injured and fatigued. In addition, the incidence of pigs exhibiting signs of stress (open-mouth breathing, skin discoloration, and muscle tremors) during loading and unloading was recorded. There were no interactions ($P > 0.05$) between distance moved and transport floor space treatments. Moving pigs long compared with short distances during loading increased ($P < 0.001$) the incidence of open-mouth breathing after loading (24.9 vs. 11.0 ± 1.03%, respectively) and tended to increase the incidence of nonambulatory pigs during loading (0.32 vs. 0.08 ± 0.09%, respectively; $P = 0.09$) and of nonambulatory, injured pigs at the plant (0.24 vs. 0.04 ± 0.07%, respectively; $P = 0.06$). However, distance moved did not affect other losses at the plant. Total losses at the plant were greater ($P < 0.05$) for the 3 lowest floor spaces compared with the 2 highest floor spaces, and pigs provided 0.462 m2/pig during transport had similar transport losses to those provided 0.489 and 0.520 m2/pig (total losses at the plant = 2.84, 1.88, 1.87, 0.98, 0.13, and 0.98 ±

0.43% of pigs transported, for 0.396, 0.415, 0.437, 0.462, 0.489, and 0.520 m2/pig, respectively). These data confirm previous findings that transport floor space has a major effect on transport losses and suggest that these losses are minimized at a floor space of 0.462 m2/pig or greater.

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Starting Newly Weaned Pigs
By Ed Barrie - Swine Sow-Nursery Specialist/OMAFRA and published in October 2007 Pork News and Views.

Starting newly weaned pigs on feed is a management intensive task. Of particular interest at this time of the year is the range in daytime to night time temperatures found across Ontario, and the knowledge that colder winter temperatures produce conditions which lead to reduced animal performance in many weaner barns. It is reasonable to check heat pads, fans and controllers and/or recorders to insure that they are working correctly now rather than after a room of new starts has been chilled, because of a failed controller. Hand held remote thermometers give a quick and immediate response on heat pads and can be used when either a room is being filled or is in operation. Sensors, fans, motors and recorders are all mechanical systems that can and do wear out, and are best replaced now if not operating correctly. Recording an event and scheduling replacement are far superior to trying to function without the unit or being forced to do an emergency repair at a difficult time and possibly being forced to use an incorrect replacement item in an emergency.

Water systems are another area where some inspection could be beneficial. Are the drinkers you are using getting the required amount of water to the animals in a method acceptable to the weaned pigs? Have you tried any new or different watering systems? The basics of multiple drinkers spread around the pen at shoulder height still apply. What is different is the addition of several bowl type drinkers to a pen, and the use of reduced pressure water nipple systems. We used to assume that water squirting out of a pig's mouth when it bit on a drinker was a good thing. In fact this is an animal that has learned that a sucking action is necessary to get nutrition, but is now forced with a pressure delivery when it tries to suck. It often takes several days to adapt to the change. In this time its reduced liquid intake can often lead to reduced feed intake which slows its ability to grow. In addition, the water wasted immediately becomes a waste product and must be handled and stored as such.

Sanitation is another of the major issues facing the weaner barn manager. It is more important then ever and more difficult then ever to get facilities as clean as they need to be before each new batch of animals is moved in. This would be a good time to review your health status of the piglets coming in, to the health status of the weaned pigs leaving the facility with your veterinarian. Not only is the average daily gain and general health status of the animals leaving important, but the disease profile of the piglets both in and out of the facility is equally important. Do you have resident bacterial loads that are acceptable, a challenge to the animals, or sufficient challenge to cause death or disease to the incoming animals? As a routine management practice, disinfectant agents should be changed a minimum of twice a year. Newer technologies suggest that pressure washing with hot water is producing acceptable results for the wash program. The disinfection process, depending completely on the instructions of the manufacturer, should be carried out, insuring the correct volume of disinfectant is applied to the area being cleaned, and applied in a method that produces effective results. These methods include foam, direct spray application and misting. Maintaining the required follow up time and temperature requirements after disinfecting and before animals are reintroduced is very important in allowing the disinfectants time to destroy the bacterial load present. The problem that occurs is that no one disinfectant product destroys the whole range of microbial and viral agents that may be present and affect the health of piglets in a weaner facility. The organisms that are not controlled tend to build up in numbers and create a serious challenge to new animals. By changing disinfectant products regularly you have a greater chance of removing more of the organisms present that may affect piglet health. In locations where serious problems persist, veterinarians could take swabs and grow out samples to be able to identify the organisms present and make more accurate recommendations on disinfectant products.

Now, having said all this it is quite realistic to expect that you have heard it all before. The question then becomes, have you read all the labels on everything you use, have you searched for better or other ways of achieving animal performance, and thirdly and most importantly do you have good records of what your style of management has produced in animal performance, doing things the way you have in the past?

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Genetic selection plays key role in success of group sow housing
02.jan.08
Farmscape
Sask Pork and Manitoba Pork Council

An Embro, Ontario based swine producer reports genetic selection will play a key role in the level of aggression displayed by sows housed in group based

production systems. In 1996, to adopt more welfare friendly housing which would allow sows to exhibit normal instincts such as rooting and socializing, Heronbrook Farm shifted from conventional sow housing to a group based system. Chris Cockle says the role of genetics on aggression and health and welfare under the group system presented a learning curve.

”The animals that we were working with at the time that we did make the switch were a very strong animal and the genetic component was changed by our breeding company to a more productive animal but in the process it became finer boned and was less adaptable to the group housing system.
We have since changed that to produce our own replacement animals and one of the major criteria in our selection program is strength of the animal, structure and hoof and leg quality.
When we made the switch to the loose sow housing we were running at about four to five percent sow mortality and when we had the aggressive sows in it peaked at about 11.2 percent in 2002.
That was when we really decided that we had to do something different.
We started breeding back our own sows and doing our own replacement program
and the last quarter on Pig Champ showed that our sow mortality was down to one percent.
I think, as far as aggression and the longevity of sows, there is a lot to do with the genetic package that you're working with.”
Cockle says, in comparing the four years previous to the switch to the four years since, there's been little difference in productivity.
However he adds, the capital cost of a group housing system is about 30 percent lower than a conventional system and while labour costs are about the same the animals are easier to work with under a group system.

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Sow housing issue not going away
Mark Whitney
University of Minnesota Extension
1/09/2008, 9:37

Consumer interest and concern with sow housing is an important, emerging issue in the United States. The pork industry has moved to using gestation stalls over the past 40 years since they reduce sow aggression and injuries. However, consumers see gestation stalls as a welfare issue, demonstrated by bans on gestation stalls in Florida and Arizona. Smithfield and Maple Leaf Foods have announced plans this past year to eliminate gestation stalls over the next 10 years, while a similar phase-out was just recently announced by Colorado pork producers.

Here are some sow feeding systems available in group housing:

a.. Electronic sow feeding (ESF), where groups of 40-65 sows are fed with one computer. Individual sow feeding occurs and physical aggression is somewhat reduced, although vulva biting is common as sows wait their turn to the feeder.

b.. Feeding stalls are a low-tech, but effective method of feeding. Sows are allowed to roam freely in their group pens, but are fed in individual stalls. This reduces competition and aggression.

c.. Floor feeding results in the greatest incidence of aggression and injuries. Dominant sows push out more passive sows and eat more feed. This results in varying body condition throughout the pen.
Distributing feed over several locations helps, but doesn't eliminate the problem.

d.. Feeding troughs and trickle feeding systems also result in aggression, injuries and dominant sows pushing others away.

Very little is known about feeding requirements of different systems. Design and management of feeding systems will be very important, regardless of the system. The sow housing issue is not going away anytime soon and will challenge our ability to understand management and economic differences in various housing systems. Understanding our best options and areas to work on will help us adapt to different housing systems if they're needed or desired.

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Managing Grouped Sows
By Janeen L. Salak-Johnson and Stanley E. Curtis, Department of Animal Sciences, University of Illinois at Urbana-Champaign. November 2007
The Pigsite, December 10, 2007

Summary
A negative public perception of the use of gestation stalls (crates) is a continual problem for the pork industry. Researchers and producers must continue to seek a solution this problem which, first and foremost, engenders and enhances the well-being of the sow. However, those solutions should not create a negative economic impact for the American pork industry. We must scientifically develop, validate, and implement alternative sow-keeping systems and sow-management strategies and tactics that are both practical and economically feasible but that effectively sustain sow well-being and preserve or increase the efficiency of producing pork. A well-defined, science-based assessment of the welfare of the pregnant sow is essential to the future of the entire livestock industry.

Unfortunately, there is a lack of data to establish welfare-friendly guidelines on how to effectively manage sows in groups during gestation. It is not as simple as removing individual stalls and forming group pens. Despite the notion held by some that keeping sows in groups is a relatively welfare-friendly practice because sows in groups can turn around and interact socially, keeping sows in

groups can lead to its own welfare problems. These problems importantly include increased aggression at mixing and feeding, increased injuries and lesions, increased variability in body-condition score, among others. All of these factors can be influenced by feeding method, social status, floor space per animal, group size, genetics, and management procedures.

Despite the choices of group-keeping systems that are being tried, many of these have not been shown to improve the dry sow's state of being. Thus, some of the many factors that should be considered when designing, implementing, and managing sows in groups during gestation are: group size, floor-space allowance, group composition (static vs. dynamic), diet type, method of feed delivery, genetics, sow temperament, and so forth. Most importantly, existing group-keeping systems differ in terms of feeding, group management, and floor type, but group keeping systems are more complex than these few factors.

Introduction

Farm-animal welfare is a major public issue for US agriculture today. Finding and using scientifically sound approaches to assess the state of being of farm animals is crucial to the long-term sustainability of American agriculture. State and federal lawmakers are continually bombarded by humane activists who offer proposed legislation on animal welfare. Unfortunately, there is a dearth of scientific information as to how to defend several contemporary farm-animal husbandry practices.

Today's typical sow-keeping system—the individual 0.61m wide × 2.12 m long stall (or crate)—is perhaps the most controversial welfare concern now facing the US pork industry. Following the European trend, which are based on public intuition as much as scientific evidence, the use of individual gestation stalls has been banned via public referenda in Florida and Arizona. New bills and referenda are set to be introduced and held in several other states, including California. Also, there have been recent announcements of intent to abandon sow stalls by Smithfield Foods, Maple Leaf Farms, McDonalds, and Burger King, among others. The national mass media have given much space and time to the goodness and rightness of abandoning the individual dry-sow stall in favor of keeping pregnant sows is groups. As a consequence, US pork producers face a dilemma: They now must decide how they will keep their sows in the future.

The term "sow keeping" refers to the accommodating and caring for breeding, gestating, and lactating sows. But the sow-keeping issue refers for the most part to "should pregnant sows be kept individually or in groups?" As for keeping dry sows in groups a variety of system alternatives have been proposed and are being tried. But neither a set of acceptable group systems nor an ideal group system has been identified. So far, results of industry and experiment-station research from around the world indicate that alternative keeping systems do not necessarily result in improving sow state of being. In fact, sows in individual stalls as compared to group pens have similar values across measurement

perspectives (McGlone et al., 2004). No one system has been identified as being better than others based on current notions of sow welfare (Barnett et al., 2001; McGlone et al., 2004; Rhodes et al., 2005).

Group Sow-keeping Systems are not Jigsaw Puzzles

Group keeping systems are extremely complex, and difficult with which to come to grips, simply because there are so many factors that must be considered and integrated. Animal accommodations are not jigsaw puzzles (Curtis, 1995). Jigsaw puzzles once were a whole picture that was, in its original form, jig-sawed into integral pieces. The pieces fit together perfectly because at one time they were together. Not so with the contemporary group sow-keeping systems we are in the process of contriving, sometimes in Rube Goldberg fashion (http://en.wikipedia.org/wki/ Rube_Goldberg_machine). The pieces, we are finding, as expected, do not always fit together perfectly or even acceptably, simply because they were not designed in the first place to fit together in the present arrangements. In the case of group-housing systems, the pieces include, among others:

- indoors or outdoors, drylot or pasture, and insulated, mechanically ventilated frame structure or hoop structure;
- floor type—slots, solid, or bedding;
- group size and floor-space allowance (will vary with group size);
- group management-static or dynamic (will vary with group size and floor-space allowance);
- group feeding systems-drop, trickle, or electronic or individual feeding stalls;
- sow-handling-labor requirement; herder safety while handling and managing manure;
- manure-handling system—suspension, scrape semi-solids to auger or belt, or Bobcat®; labor requirement;
- capital costs, maintenance costs, and operating costs;
- behavioral management, disease management, and disease-preventive and treatment management; and
- sow state of being, sow productivity, and sow productive lifetime.

As empirical observations and experimental results accumulate, it is clear that each piece has advantages and each piece has disadvantages in terms of productivity, profitability, and, yes, animal welfare. All of the current group-system alternatives allow sows, some freedom of movement, opportunity for social interaction, and individual choice among (available) microenvironments. But there are greater or lesser welfare problems associated with each of these Rube Goldberg group-keeping systems, too, including, stress due to aggression early on and social tension for the duration, variable body-condition score, and injury.

Moreover, clearly, more highly skilled and more attentive stockmanship is required to successfully manage sows in groups. And, even more importantly, when a group-keeping system fails to work well, some sows inevitably

experience a poor state of being. The sow-welfare problems in a group system can be horrendous (McGlone, 2006; Curtis, 2007).

Keeping Sows Individually versus in Groups

Based on scientific evidence and empirical observations there are positive and negative aspects of all systems of sow accommodation that have been tried. The sow is a creature that is difficult to keep. As for reproduction, few studies have shown reproductive impairment in pregnant sows kept in stalls as against sows in groups. Although some studies have shown greater reproductive performance for sows in groups than in stalls (Bates et al., 2003; Lammers et al., 2007), some findings have been that reproductive performance is similar for sows either in groups or in stalls (Langendijk et al., 200; Harris et al., 2006; Salak-Johnson et al., 2007). Whereas others have found greater reproductive performance for sows that gestated in stalls as compared with those that gestated in groups (Barbari, 2000; Bates et al., 2003; Karlen et al., 2006).

How might the differences in results and conclusions have arisen?

Phase of Reproduction

It recently has been documented that welfare challenges to the sow change over time. Sows in groups during early gestation have increased incidence of scratches, higher estrus return, and higher cortisol concentration, whereas, sows in stalls have increased lameness during late gestation (Karlen et al., 2006). These findings are similar to those reported by Salak-Johnson et al. (2007), wherein lesion scores for group-housed sows were high at group-formation (mixing) time, plateau during mid-gestation, but increased again during late-gestation. Even the European Union regulations already recognize this as they provide for sows to be kept in individual accommodation during breeding and the first few weeks of gestation, when reproductive functions are most sensitive to deleterious effects of social strife and other stresses. This, of course, further complicates the rational design of the ideal sow-keeping system. Thus, we probably should accommodate sows differently during different stages of reproduction.

Stereotypies

Stereotypic behavior patterns (e. g., repetitive, invariant, apparently functionless and purposeless bar- and trough-biting, sham-chewing, drinker-pressing, floor-nosing, head-weaving) often are used as a measure of sow welfare. Differences in stereotypic behaviors between sows in stalls and those in groups have been found (Vieuille-Thomas et al., 1995). Specifically, sows in groups spend less time interacting with bars and troughs (Karlen et al., 2006). Others, however, have reported no differences in stereotypic snout behaviors between sows kept in indoor stalls and those kept in outdoor groups (Dailey and Mc- Glone, 1997).

Although sow behavior in this regard may differ among housing systems, often it seems some component such as direction of bars or other design feature that is responsible for the behavior displayed by the sow (Dailey and McGlone, 1997;

McGlone et al., 2004). In other words, sow repetitive behavior patterns seem to be partly driven by external stimuli and opportunities, and therefore can be designed out of a system. Only if it has been established that a behavior is internally driven and clearly associated with reduced welfare need we have ethical concerns about its display.

Also, conclusions that these behavior patterns are a bad sign in terms of sow welfare may have been premature and erroneous. Pregnant gilts either on pasture or on drylot or in stalls showed similar amounts of snout behaviors (Daily and McGlone, 1997). These behaviors did not start with the gestation stall, and they apparently are at least partly triggered internally. So, if anything, they ought to be accommodated and encouraged not neutralized and discouraged. Most stereotypic snout behaviors in sows come around the time of once-daily feeding of a restricted ration. So there also seems to be an external component in the motivation for such snout behaviors. So it now seems that the sow's motivation to display repetitive snout behaviors is mixed—internal and external—and therefore it is complex and will not be easy to come to understand. Finally, there is good evidence that restricting a small ration of highconcentrate diet to a once-daily feeding causes hyperacidic indigestion in the sow. Those repetitive snout behaviors result in increasing saliva secretion, the buffering capacity of which neutralizes the heartburn. Thus, the bottom line is that the sow's so-called snout stereotypies might not be functionless or purposeless after all.

Plusses and Drawbacks Around

There are both advantages and disadvantages associated with dry sows being kept either individually or in groups during gestation. No keeping system in either category has been identified, developed, or optimized such that it ultimately and invariably sustains the well-being of the pregnant sow.

Possible explanations are that

- most studies have not taken a holistic approach by assessing multiple measures of state of being,
- most studies have compared so-called "systems" but have not considered all of the features of those respective systems that can influence how a sow responds to and interacts with her environment, or
- both of the above.

It is crucial that producers realize that there is more than the several approaches for each of the several design features, and thus many permutations of design features. Numerous feature combinations are possible, and not all of them work.

Management of Sows in Groups

How should we manage sows in groups? This is a million dollar question for which we do not yet have a definitive answer. According to the AVMA website, sow keeping systems should attempt to:

- minimize aggression and competition among sows;

- protect sows from detrimental effects associated with environmental extremes, particularly temperature'
- reduce exposure to hazards that result in injury, pain, or disease;
- provide every animal with daily access to appropriate feed and water;
- facilitate observation of individual sow feed intake, respiratory rate, urination and defecation, and
- allow sows to express most normal patterns of behavior.

Additional management strategies that should be considered are:
- once a small group (4 or 6) of sows has been established, no more sows should be added to the group;
- mix sows only if they are being kept in larger groups (20+);
- if sows are mixed, mix in a new pen not a hometerritory pen; and
- if an individual feeding system is not being used, sort and establish sow groups according to sow eating speed to reduce fighting and undernourishment (Temple Grandin, http://www.grandin.com/welfare/tips.sow.housing.html).

Group Housing Systems: Factors to Consider

Keeping sows in groups during gestation is not as simple as removing individual stalls, forming group pens. Despite the perception that keeping sows in groups is a relatively welfare-friendly practice as compared to using individual stalls simply because sows in groups can turn-around and interact socially, keeping sows in groups can lead to its own welfare problems. These mainly include increased aggression at mixing and feeding, increased injuries and lesions, increased variability in body-condition score, and so forth. All of these factors can be influenced by feeding method, social status, floor space per animal, group size, genetics, and management procedures. Thus, some of the many factors that should be considered when designing and implementing group keeping systems are group size, floor space allowance, group composition (static vs. dynamic), diet type and method of feed delivery, genetics, sow temperament, and so forth (Levis, 2007). Most importantly, group-keeping systems differ in terms of feeding, group management and floor type.

Feeding Systems and Management

What are our feeding options? Feeding systems can be first categorized as individual or group systems. Feeding grouped sows individually can be accomplished by using individual feeding stalls of some sort or electronic sow feeders (ESF).

Individual stalls. Individual feeding stalls will minimize aggression at feeding time, but some aggression still occurs. Also, it is not possible to feed individual rations because sows enter stalls somewhat at random at feeding time.

Electronic sow feeders. With ESF, each sow wears a transponder and eats by entering a feeding station, and each sow has her own daily feed allotment. Each

feeding station can accommodate ~40 sows. A sow can consume her entire daily ration in one meal during a single daily visit or in several smaller meals spaced throughout the day. Aggressive physical acts can occur while sows are waiting to enter the feeding station (Jensen et al., 2000; Anil et al., 2006). Vulva-biting is a welfare concern associated with ESF, but attempts have been made to reduce vulva biting. Appropriate feeder design and placement have reduced the incidence and severity of vulva biting (Levis, 2007).

Group-feeding options. There are three general approaches to group feeding: trough feeding, single-drop feeding, and floor feeding. These feeding systems have been used for small groups of ~6 as well groups of ≥100 sows.

Floor feeding, where the feed is simply dumped on the solid floor, engenders the most feeding-time aggression because sows compete for feed. Dominant sows overeat and become fat, submissive sows become thin. However, Salak-Johnson et al. (2007) found that floor feeding sows in groups of 5 at floor10 space allowances of 2.3 and 3.3 m2 had greater body weight and backfat depth than did sows in groups of 5 at 1.4 m2 per sow or individual stalls.

Single-drop feeding, in which a single drop of dry feed across a wide area is made once a day, also has been tried. This system leads to increased aggression because some sows eat faster than others and will consume their own allotment and then go looking for more, stealing the feed of others. Threats, attacks, and fights were evident in a study by Jansen et al. (2007) that involved 32 drop-feeders depositing feed into 3 troughs across the width of a pen for 50 sows.

A modification of single drop feeding is the trickle-feeding system wherein feed is continuously delivered at a slower rate over a period of time. There seems to be less aggression expressed in this system. Both the drop-feed and trickle–feed systems operate well with a wide range of group sizes, the most common group size being 5 to 6 sows. Hulbert and McGlone (2006) reported that neither pen type (individual or group) and nor feeding system (drop or trickle) was associated with physiological stress responses in sows. Feeding system had no affect on social interaction or overall activity, although gilts in group pens equipped with drop feeding did show more snout behavior at 1200 h than did those in trickle-feeding pens. Over a 24-h period, however, snout behavior did not differ with feeding system. Neither did time spent feeding differ between drop- or trickle-fed sows. Treatment differences in behavior were due to available floor space not feeding system. Despite the general perception that sow aggression is reduced with trickle feeding, it still is not perfect in this regard. Aggressive behavior and poor and variable body-condition score are still apparent in group systems with trickle feeding (personal observation, November, 2006).

Static versus Dynamic Group Management

The question remains: How can we minimize aggression and competition among group-kept sows? The most serious and injurious aggression and competition among group-kept sows occurs upon introduction of new sows to a group (mixing) and at feeding-time. Upon mixing, sows will fight with a high level of aggression, part of their natural attempt to form a new dominance hierarchy. The aim of sow management must be to enable the formation of the social order with as little stress and physical injury as possible.

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Periparturient Risk Factors for Sow Mortality
By Maya Kuratomi, M.S., Sukumarannair S. Anil, D.V.M, Ph.D., University of Minnesota and published in Swine News, Volume 30, Number 8 NCSU. October 2007

Introduction
Sow mortality is an important economic and animal welfare concern for pork producers. Mortality is an economic drain on sow farms (Duran, 2001). In addition high sow mortality affects employee morale (Deen & Xue, 1999) and is an important welfare indicator (Broom, 1996). Currently, the suggested target for herds of more than 200 sows is to keep annual rates below 5%, and some researchers advocate increasing this target to 8 to 10% for herds of more than 1,200 sows (Duran, 2001). A

Sow mortality is affected by factors related to health, management, and environment. The periparturient period, defined as the last 10% of the gestation period and the first few weeks post-partum, is a time of high risk for sows with over 50% of mortality occurring during this time (Duran, 2001; Anil et al., 2005). Parity, farrowing induction, stillbirths, and season have all been identified as periparturient factors influencing sow mortality in previous studies (Deen & Xue, 1999; Koketsu, 2000; Deen, 2003; Chagnon et al., 1991; D'Allaire eta al., 1996). While not all the factors associated with sow mortality can be controlled, understanding them will assist producers in minimizing death loss. The present retrospective study analyzes the association of induction and other periparturient risk factors with sow mortality.

Materials and methods
This study involved 312,000 parity records from 16 U.S. commercial farms retrieved from the PigCHAMP database (PigCHAMP Inc. Ames, Iowa) for sows serviced between January 2001 and December 2004.

The production outcome evaluated was sow death (including euthanasia). Data on parity (1-2, 3-5, > 5), day of farrowing (weekday or weekend), pigs born alive per litter (continuous), stillbirths (0, > 0), mummies (0, > 0), season of farrowing (summer, other), induced (yes, no), and number of services (1, > 1) were retrieved from the PigCHAMP databases of the respective farms.

A multivariate logistic (Proc Logistic) regression models, with farm as a random effect variable (Glimmix macro), were fitted to evaluate the association of the selected variables with sow mortality. All statistical analyses were performed using the statistical software package, SAS v. 8.2 2001 (SAS Institute, Cary, N.C.). The reported reasons for sow removals were also collected from the PigCHAMP database, and the proportion of removals was calculated. Death and culling rates were obtained from the PigCHAMP performance monitor reports.

Results and discussion

Over the four-year period, the sow death rate on the farms in this study ranged from 4.8% to 19.1% with a mean of 8.9%. Farm records indicated that 24.9% of sow deaths were due to problems related to farrowing. Other studies have also found this period to be critical to sows as more than 50% of mortality occurs in this time period (Duran, 2001; Deen & Xue, 1999; Anil et al., 2005; Chagnon et al., 1991).

When we applied the multivariate model, we found that parity is positively associated with sow death. This is consistent with previous studies. However, individual farm culling practices have great influence on the type of older sow removals (Deen & Xue, 1999).

Sows having litters with stillborn pigs were more likely to die than those with no stillborn pigs ($P < 0.0001$). Litter stillborns are related to both the viability of the pigs born and the attention given to sows during parturition (Holyoake et al., 1995). Thus the relationship of stillborns and mortality is reflective of both sow condition and management of the farrowing barn.

Only a few studies have addressed sow injury or mortality associated with farrowing induction. Studies examining different induction protocols have shown an increased need for assistance and interrupted piglet delivery with certain common induction drugs (Yang et al., 1996; Kirkwood & Aherne, 1998; Cassar et al, 2005; Kirkwood, 1999). These effects are related to more painful, stressful delivery, and greater chance for sow injury (Kirkwood & Aherne, 1998; Cassar et al., 2005), leading to further complications and sow death. In our study, sows that were induced were 11% more likely to die than those that farrowed naturally ($P = 0.002$).

The presence of mummies in a litter, farrowing on a weekend or weekday, number of services required for conception, and total-born-alive litter size were not associated with sow mortality, when controlling for other factors.

In conclusion, this study found measurable sow attributes, such as parity, stillbirths and induction, are significantly associated with sow mortality. Attention should be given to the periparturient sow. Inducing farrowing can increase sow mortality risk and should not be used without justification and care. This study is

a retrospective observational study using computerized records from commercial farms. The results could be affected by housing, nutrition, environment, and genotype which were not measured. Results could be further biased because the data was both producer recorded and volunteered. Discrepancies between the type of removal (death, euthanasia, or culling) and reported reasons for removal were noted and are a potential source of errors.

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Gestating Sows in Hoops: Can It Work?

By Ronald O. Bates, State Swine Specialist, Michigan State University and published in MSU Pork Quartlery 2007 Volume 12 No. 1.
September 2007

Introduction

With two states banning the use of individual stalls for gestating sow housing and the announcement from Smithfield Foods that their production systems will SLOWLY move toward group housing of gestating sows, there is much interest in alternative sow housing systems. It should be said though, that sows housed in individual stalls allows for adequate management of the sow and that there is no welfare advantage for sows housed in groups versus those housed individually in stalls (AVMA Task Force Report. 2005). Nonetheless, different forms of group sow housing are being investigated as possible alternatives to individual sow housing. This article summarizes a report (Lammers et al., 2007) that compared sows that were housed individually during gestation to those that were housed in groups in Hoop Buildings during gestation.

Study Design

This study was conducted near Atlantic IA, at the Lauren Christian Swine Research and Demonstration Farm from March, 2001 to September, 2003. Sow genetic background was ½ Yorkshire: ¼ Hampshire: ¼ Landrace. Sows farrowed and lactated in individual conventional stalls in an environmentally controlled building until weaning. After weaning sows were placed into slatted floored pens in an environmentally controlled building and mated in a common breeding facility and then allocated to one of two gestation housing treatments. All females (weaned sows, gilts, recycles, etc) which had been mated within 9 days after a group of sows were weaned constituted a group (up to 32 females). Sows allocated to the gestation stall treatment were kept in 2’ x 7’ ft. stalls, in an environmentally controlled building, after mating and throughout gestation. Sows allocated to the group housing treatment, were placed into stalls after mating and then moved into a hoop structure, within the 9 day span mentioned previously. Sows housed in groups were allocated 37 sq. ft. of space per female, of which 25.4 sq ft. was the bedded area and 11.6 sq. ft. was used for feeding stalls. For the group housing treatment, there was a feeding stall for each sow. Feeding stalls were latched while a sow consumed its feed but remained open during non-feeding times. All gilts were gestated in stalls after mating and then placed into one of the two gestation treatments after weaning their first litter and returning to estrus.

All sows were fed 4.5 lb/day during the first 2/3 of gestation and then increased to 6 lb/day for the final 1/3 of gestation. From November through March, feed fed to sows in gestation stalls was increased 5% while sows in groups in Hoop Barns had their feed increased 25% to offset increased thermal demands for winter.

Results

Sows which gestated in groups in Hoop Barns weighed more at 110 days of gestation (~ 9 lb) and were fatter (~0.05 inch) than sows which gestated in stalls. Sows which gestated in groups in Hoop Barns lost more backfat during lactation (0.02 in) but had similar weight loss while nursing. Though weighing more and being somewhat fatter at the beginning of lactation, sows which gestated in groups in Hoop Barns had similar lactation feed intake to those sows housed in individual stalls.

There were few differences due to gestation housing treatment for reproductive performance. Sows housed in Hoop Barns did have more total pigs born than sows which gestated in stalls (11.7 vs 11.3, respectively) and subsequently had more number born alive (10.9 vs 9.7, respectively). After farrowing, litter size was standardized across treatments and no difference in number weaned was observed between sows which had gestated in group or individual housing (avg. 8.85 pigs weaned). Sows which gestated in Hoop Barns did take longer to return to estrus after weaning than did sows which gestated in individual stalls (6.0 vs 4.3 days, respectively).

Conclusion

Sow which gestated in groups in a Hoop Building did farrow more pigs but took longer to return to estrus that individually housed sows. Sows gestated in groups in Hoop Buildings were offered more feed during the winter but were just slightly fatter and heavier at farrowing. Overall this demonstrated that sows housed in groups can be managed to obtain similar reproductive performance (i.e. littersize) in comparison to sows housed individually in an environmentally controlled building.

Final Thoughts

The results of this study should be taken at face value without further generalization. Sows which are put into groups quickly after mating (2-5 days) can achieve similar reproductive performance as individually housed sows. In addition, gilts were not placed into group housing with sows which does add to the complexity of the interpretation of the results. Bred gilts included into groups with sows can be at a greater risk of being dominated by older and heavier females which can be detrimental to their reproductive performance and welfare. Furthermore, though Hoop Buildings may be cheaper in construction costs than environmentally controlled buildings with individual sow housing, feed costs per sow may be higher, due to increased feed allocation during winter, as was demonstrated in this study. Group housing of gestating sows can be done in a satisfactory manner; however, several factors including, feeding method, day of gestation after mating when grouped, parity distribution, housing type and square footage allocated must be considered when developing a group housing system.

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JSR And Guelph University Team Up To Tackle Boar Taint
Source: October 24, 2007 PigSite.com

UK - Geneticists at JSR, the UK's leading pig genetics company, are uniting with top research scientists at The University of Guelph, Ontario and representatives from major abattoirs, to tackle the persistent problem of boar taint. Utilizing the most advanced gene marker technology, the multi-talented team is aiming to identify the genes responsible for high levels of androstenone and skatole - the two compounds that cause boar taint - enabling them to accelerate the 'low taint' selection process. Eventually, it is hoped that boar taint could be virtually eliminated across the different breeds, boosting the popularity of pigmeat worldwide. The scientists at Guelph have focused on the two ways in which levels of boar taint compounds can be reduced; by decreasing their synthesis and increasing their metabolism. Now, by identifying the candidate genes controlling skatole and androstenone levels, and using markers responsible for the different functionalities of the genes, they will identify pigs with undetectable boar taint. This has far reaching advantages, as Steve De Brabandere of the University's Business Development Office confirms, "Working alongside JSR gives our research not only added impetus but very real, practical focus. Lines offering low boar taint will mean that males won't have to be routinely castrated to avoid the problem. Whilst castration effectively reduces boar taint, it also has repercussions in terms of compromised growth and pig welfare". Initially, 32 markers were identified from 18 genes tested in eight commercial lines - involving 1,300 pigs in total - with significant marker effects in the different breeds. Now, however, a more complete set of 140 DNA markers from over 30 genes has been identified and the team is currently testing these markers in both the research cohort and animals from commercial lines to establish those that are most effective. Dr Grant Walling, Director of Research and Genetics at JSR believes the research is nearing fruition, 'It is always our intention to prove the worth of our research in the real world. With respect to this project, our ultimate aim is to produce a 'toolbox' that can be used to provide boar taint solutions throughout the different commercial breeds. At the moment, different markers show a varying degree of association in the individual breeds. With the expertise and support of our partners at the University of Guelph we expect huge strides toward getting values of androstenone and skatole well below the sensory threshold, and we hope in the near future to be able to develop a line of pigs in which boar taint is undetectable to human taste."

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Research: Unsedated Piglet Castration Is Useful
Source: October 22, 2007, Atlantic Swine Research Partnership, from www.pigprogress.net 17 Oct 2007

The use of local anaesthetics for male piglets prior to castration does help to alleviate the pain for the piglets. The Dutch newspaper Agrarisch Dablad reports today that this was concluded by researchers from Wageningen University and Research Centre's Animal Sciences Group, the Netherlands, after having studied the pros and cons around anaesthetised castration. It is even better, the scientists concluded, to combine anaesthetics with a painkiller injection to reduce post-surgery pain.
Costs: Costs for this extra work were calculated for the Dutch case. Should local anaesthetics be applied by a vet, then castration costs rise with approximately 1 euro per male piglet. In case producers can do it themselves, costs would only reduce to 0.28 euro. The researchers also checked the option of general anaesthetics using CO2. It was noted, however, that disadvantages of this process include very narrow safety margins and risks for piglet deaths through excessive CO2 concentrations.
Research: Basically, the researchers tested five different castration methods and subsequently they checked the animals' reactions like screaming, skin temperature and certain blood levels. When using anaesthetics, the piglets squealed less and their blood levels proved to be better. The research, however, also showed that the animals that were anaesthesised did have more post-surgery pains. This disadvantage could be taken away by giving painkillers.

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Sow Management and Housing:What Does The Industry Think?
Source: November 29, 2007, The Prairie Swine Centre, Lee Whittington, M.B.A.
Background: Maintaining research facilities that have the capability to meet industry needs is at the core of Prairie Swine Centre's mandate to serve the industry with near-market research information. Two years ago a review of the 300 sow farrow and gestation facilities at Floral resulted in an application for funding to the province of Saskatchewan. A significant effort by Saskatchewan Agriculture and Food to replace the ageing 1980 barns was developed with the Federal government and the result is a shared federal/provincial grant for the renovation of the gestation, breeding and farrowing facilities. The resulting facility will allow PSC to accomplish several objectives. Firstly, the current facility will be challenged to meet the current standards of animal care expected of a research farm. Secondly the construction of the new barn will actually reduce the operating costs of the farm through improvements in energy efficiency, but more importantly labour. This improved efficiency in labour will come from the fact the staff currently service the sow herd and gilt development spread over four separate buildings, and in the new design all animals will be within the same building. As well the labour currently used to hand feed will be better utilized

when gestation and farrowing sows will be fed automatically in the new barn. Lastly the old barn had reached a point where ‘band-aid’ maintenance solutions to fix penning, equipment, and flooring where becoming significant. Industry

Stakeholder Input: Once the funding of the new facilities was confirmed we developed a strategy for ensuring that the facility would meet internal as well as external stakeholder interest and needs. This included a thorough discussion with three distinct groups within industry: 1) pork producers with direct experience with alternative sow housing either in Canada or elsewhere, 2) pork producers with interest in the area of sow housing; and 3) producer boards, governments, and farm animal councils interested in the policy implications of alternative sow housing and welfare. Thank you to all of the pork producers and industry personnel that participated in the many meetings in late April and throughout the month of May. The review involved in-person and telephone interviews conducted by Lee Whittington and Harold Gonyou with a total of 27 companies and agencies. A total of 89 people participated, 61% of which were primary pork producers. This industry review took place in the provinces of BC, Alberta, Saskatchewan, Manitoba, and Ontario. The resulting information, and opinions expressed can be organized into three broad categories: challenges and opportunities with alternative sow management; other opinions regarding alternatives; and research opportunities in the area of sow management and housing. The topic of sow management was focused, timely and apparently highly valued based on the excellent response of industry to meet with us in a short period of time. This area is of immediate concern as all pork producers are considering what if any changes they will make to their operations in light of the announcements by Smithfield, Maple Leaf Foods and Wendy’s regarding group-housed gestating sows.

Industry: Reaction: In general, the industry is well aware of changes in attitude taking place within the public, the media and special interest groups regarding animal welfare in the barn. There is concern that in fact there are housing and management options proposed to replace gestation stalls that provide questionable welfare improvements for the animals and at the same time are considered ‘animal friendly’ by people outside the industry just because they allow animals to live in groups. This quick-fix solution includes maintaining the front two feet of penning and feeding trough of the original gestation stall, while allowing two rows of back to back stalls to share a common alley. This has left the industry very interested in developing experience and new information that will allow them to transition to new sow management systems that embrace some form of group housing but do not jeopardize the excellent production being achieved, and do not reduce the level of welfare provided by well-managed gestation stalls.

Some general observations: • A general acceptance of alternative systems is evolving, however the reality is barns must continue to produce the target number of pigs per week, within the same barn footprint. • All pork production

groups are embracing the idea of alternative gestation housing. There is no consensus how that will be accomplished within the current barns. • There is a concern that this move to groups is the start of the process that may bring farrowing crates into question. This is unanimously considered counter productive to animal wellbeing and productivity. • Larger production companies are moving quickly. At least one group will start a conversion of one barn to groups in fall 2007 and two more companies will follow within the next 6-12 months. • Renovation is considered the largest obstacle due to manure handling and penning investments in current barns. Renovation is also considered the most likely route to modified group sow management compared to building new structures. This is especially true in Manitoba where new construction is not an option, and the growth of the industry from 2 million sows to 9 million in the past 10 years means assets have high values. • Alberta has several operating barns with straw-based manure systems. Many producers will not use straw for a variety of reasons that include manure handling, biosecurity and barn air quality, but for these Alberta producers they have overcome these challenges and are reporting excellent productivity. • There will not be one 'ideal system', as renovation is going to be a part of most farms. Any research needs to investigate basic sow needs that can be applied across a wide variety of barn designs. • The industry has a keen interest in seeing research done in the farrowing area to address the increasing litter size anticipated (in excess of 14 born alive in next 5+ years) combined with older weaning ages (3 to 4 weeks) making improvements to current farrowing crate design, pen sizes and feeding programs required.

Research Capability: The question of how research could help address sow management generated a significant list of over 100 ideas! The new barn is being designed with these in mind. First on the list of priorities for the new barn is to produce piglets for the nursery and grower-finisher research program, so the facility must be a functional production facility. The current facility, although not pretty and somewhat labour intensive by new barn construction standards, has a dedicated staff currently producing 11.4 born alive, on over 800 farrowings each year with a preweaning mortality of 10%. In addition to being a good production facility, this unique opportunity to construct a new barn at a research farm does not come along that often and developing a barn that can rise to the challenges of the industry for the next 25 years is also taken seriously in the design. In summary, the new facility will fill two roles: as an efficient production unit, and to conduct novel sow research. I have highlighted some of the suggested research projects that were noted by a high proportion of pork producers: o Training mature sows previously housed in stalls to use ESF (Electronic Sow Feeders). How to determine as early as possible which sows cannot be trained so they can be returned to stalls for balance of the pregnancy. What means are available to reduce space allowance per sow. For example, location, shape and size of loafing area. How to minimize space used when building a 'cafeteria' feeding system that requires sows to be moved daily from loafing area into feeding area. The size of stalls required varies depending on their use. Are they feeding versus sleeping stalls. The housing and management of gilts and 1st liter sows

separately from mature sows. Is this age group best served by having some time in stalls or treated as a separate group not to be mixed with mature sows? Barn

Design: To address these and other research needs the barn will be designed to allow key elements like group size, space per sow, and feeding for stage of gestation and parity questions to be investigated. This has resulted in the gestation portion of the barn incorporating additional space to replicate the various scenarios that might be seen on a commercial farm. To do this the basic gestation barn will consist of six large pens each of which accommodate two weeks of breedings. Each of these two-week breeding groups will be housed in two rows of lock-in stalls separated by a shared slatted area of 10 feet. In addition, a solid floor area will form a 'T' on the end of the shared slatted area. This design allows the most popular systems to be tested, including standard 24 inch gestation stalls, walk-in lock-in stalls for group housing, replicating a cafeteria feeding system moving sows daily from a non-feeding group pen into the walk-in stall, and floor feeding in groups. ESF feeding is not anticipated in this facility since there are seven units at the PSC Elstow Research Farm. This design also allows the maximum flexibility to test space requirements under different scenarios and the effect that may have on animal behaviour. A schematic of the gestation area is shown in Figure 1. The Bottom Line: Research capability is being designed into the new sow barn to accommodate studying the effect of key components of sow management, particularly those that have to do with gestation sow management and housing such as space allowance, group size and feeding. Each of these will be critical factors in developing any renovation that pork producers may wish to pursue in developing a system that ensures low cost productivity as well as embracing a group housing component.

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Prairie Swine Centre Expands Group Housing Research
Source: November 27, 2007
Farmscape.ca, Bruce Cochrane

Canada - Renovations are underway at the Prairie Swine Centre's Floral research facility in Saskatchewan. It will allow scientists to expand research into group housing of sows and weaning age of piglets. Renovations of the Prairie Swine Centre's gestation and lactation facility and gilt development area located near Floral, Saskatchewan are scheduled to be completed by next April. CEO Dr. John Patience says, in addition to improving the efficiency of the 30 year old facility, the renovations will allow the centre to expand its research into group housing of sows.
"That's one of the subjects that faces our industry as we move into the future and the challenges to gestation housing so we will be putting in a new kind of group housing system. At the Elstow facility we were able to look at electronic sow feeders as one alternative to group housing of sows and in the new unit we'll be

putting in what's called "walk in lock in stalls" which allow the animals to go into a stall in order to be fed but then they have the ability to leave the stall and wander in the loafing area when they're not being fed. This is a design that we have borrowed from the Europeans and specifically from Denmark. It is, we understand, the most popular group housing system in Denmark right now in new facilities and so we thought it would be a good opportunity for us to evaluate it from a North American context."
Dr. Patience notes scientists will also be moving to four week weaning in the farrowing area and comparing weaning at three weeks of age to four weeks. He notes the industry is moving to older weaning for a variety of reasons, including the ability to feed lower cost diets to piglets weaned at four weeks versus three weeks of age, a reduced need for medication in the feed and improved productivity of the later weaned piglets in the grow finish barn.

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Don't Mix Sows 10-14 Days after Breeding
The National Pork Board and the University of Guelph-Ontario Ministry of Agriculture, Food and Rural Development Animal Research Program funded the study. Researchers: Glen Cassar, Monica Seguin, Tina Widowski, Abdolvahab Farzan, Adroaldo Zanella, and Robert Friendship, University of Guelph; and Roy Kirkwood, DVM, Michigan State University.
Source: December 19, 2007 AASV

As pork producers take up the challenge to house gestating sows in groups vs. individual stalls, questions arise about the impact that mixing and grouping will have on farrowing rates and litter sizes. In a joint Michigan State University/ University of Guelph study, 617 newly bred, mixed-parity sows were assigned to individual stalls or grouped 15/pen. Each group of 15 unfamiliar sows was comprised of three sows at each of 2, 7, 14, 21 and 28 days after breeding. Sows were fed 5.5 lb. of standard gestation ration once a day, on the floor. Of the total, the 122 sows housed in individual stalls after breeding served as "controls". Sows spent five weeks in groups and then were moved to individual stalls until they farrowed. Neither the impact of grouping, nor the day of gestation they were grouped appeared to affect subsequent litter size. However, farrowing rate tended to be lower for sows mixed at 14 days of gestation. "Mixing of strange sows into groups can be done without adversely affecting fertility," researchers noted. "However, the period about the time of first signal for maternal recognition of pregnancy (10-14 days) is more sensitive to the stress of grouping strange sows and therefore should be avoided."

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A cross-sectional study of the prevalence and associated risk factors for capped hock and the associations with bursitis in weaner, grower and finisher pigs from 93 commercial farms in England

Source:October 8, 2007, AASV News, Harry Snelson
The prevalence of capped hock in 5601 post-weaning pigs from 93 pig farms in England was 17.2%. The prevalence increased with age. Once adjusted for age, the lowest prevalence of capped hock was observed in pigs kept on soil floors (usually covered with deep straw bedding). There was no significant increase in the risk of capped hock in pigs kept on solid concrete floors with deep straw bedding. However, pigs kept on solid concrete with some, or the entire pen, sparsely bedded and pigs kept on partially or fully slatted floors had an approximately threefold increased risk of capped hock. This did not vary significantly between these four floor types. This was in contrast to the associated risks for bursitis in the same pigs, where as the floor went from highly resilient (straw and solid floors) to hard and perforated (fully slatted) the risk of bursitis increased in a similar way to a dose response. No other variables that were measured were associated with a change in risk for capped hock, while observation of pigs slipping or slip marks and wet, dirty and worn pens were also associated risks for bursitis. These results indicate that capped hock and bursitis are both affected by exposure to floors, but in different ways. The prevalence of capped hock was associated only with floor hardness, with deep straw protecting the pigs, while bursitis was associated with both changes in bedding depth (hardness), floor material (soil versus concrete) and floor construction (solid versus slatted floors) and in factors associated with locomotion (slipping and slip marks). These results indicate that the aetiology of capped hock and bursitis might differ.

A.L. KilBride, C.E. Gillman, P. Ossent and L.E. Green, A cross-sectional study of the prevalence and associated risk factors for capped hock and the associations with bursitis in weaner, grower and finisher pigs from 93 commercial farms in England, Preventive Veterinary Medicine, Article in Press, Corrected Proof, Received 25 October 2006; revised 8 August 2007; accepted 9 August 2007. Available online 1 October 2007.

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Effect of supplementing sows' feed with alpha-tocopherol acetate and vitamin C on transfer of alpha-tocopherol to piglet tissues, colostrum, and milk: Aspects of immune status of piglets
Source: October 8, Atlantic Swine Research Partnership
The aim of this study was to investigate the effects of dietary supplementation of sows with alpha-tocopherol acetate (ATA) and vitamin C on deposition of alpha-tocopherol (AT) in piglet lymphoid organs, such as bone marrow, thymus, and spleen at birth and at weaning, as well as on indicators of immune response in piglets. Sows were given the following treatment diets: control, vitamin C 10g/day, ATA 500mg/kg feed, and combined vitamins (ATA 500+Vit-C 10). Supplementation with vitamins started at the beginning of pregnancy and lasted until weaning at 21+/-3 days of age. AT was determined in colostrum, milk, piglet plasma (cord blood) and tissues at birth and on day 21. Immunoglobulins were measured in piglet plasma, milk, and colostrum. Lymphocyte proliferation in response to PHA and ConA was determined in sow

and piglet blood. ATA supplementation resulted in a significant increase (P<0.001) in the AT content of colostrum, milk, piglet plasma, liver, thymus, bone marrow, and spleen at weaning. The AT content of colostrum and milk significantly (P<0.001) influenced the AT content of piglet plasma and tissues at weaning (day 21). Total Ig and IgG concentrations in piglet plasma were significantly increased in piglets given the combined vitamin treatment. No effect of AT supplementation was observed on IgG and IgA in colostrum and milk. In sows, vitamin C given alone significantly increased lymphocyte response to ConA and PHA; whereas, in piglets, there was no significant effect of treatments on lymphocyte response to PHA and ConA.

Pinelli-Saavedra A, Calderón de la Barca AM, Hernández J, Valenzuela R, Scaife JR. Centro de Investigación en Alimentación y Desarrollo, A.C., Carretera a la Victoria, Km 0.6, P.O. Box 1735, Hermosillo, Sonora 83000, Mexico; Department of Agriculture and Forestry, University of Aberdeen, 581 King Street, Aberdeen AB24 5UA, Scotland, UK.
Res Vet Sci. 2007 Sep 26;

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Sow Longevity - A Complex Issue
Author: Dr. David Meisinger
Indiana State University
Farms.com
Oct 20, 2007

At the recent Discover Conference on Sow Productive Lifetime (SPL), many industry experts concluded that the issue really has to do with sows leaving the herd prematurely for a variety of reasons including genetics and environmental, which includes gilt development, nutrition, health, housing, caretaker skills, behavior, seasonal effects, and markets.

One speaker summarized that sow retention was a primary driver of unacceptable replacement rates and that this presented an opportunity for improvement. He said data suggests the largest variation occurs between parity zero and parity two (P0 to P2). Based on this information, another speaker suggested separating the breeding herd into two populations, including developing sows and mature or geriatric sows.

A nutritionist speaking at the conference supported his proposition that older sows need attention to micro-nutrient nutrition while younger sows need emphasis on protein body loss prevention.

One speaker questioned why there is a higher death loss at all levels in males (castrates and intacts) compared to females. No answer was forthcoming, so a research need was identified to solve this problem. Other research needs included group housing vs. individual sow housing, modern genetic lines with a greater ability to produce in modern confinement systems, the role of stockpeople and animal husbandry, and many other nutritional, reproductive, management and health or immune response questions that could positively impact the productive nature of the sow.

During a discussion of pens vs. group housing of sows, many cautionary notes were made. These include the fact that group-pen housing always requires a higher level of management, and a higher safety factor is important when working with these sows. It was also suggested that group-pen housing will be a training challenge. Speakers agreed that at least 8-10 sows should be included per pen because with 4-5 sows, one sow will likely receive the brunt of negative attention.

Feeding systems that provide attention to individual sows in a group setting will be a challenge. A new system was shown at the conference that drops feed in a free access stall. It was agreed that a cost benefit analysis or return on investment calculation pertaining to feeding lactating sows needs to take place.

Another speaker stated that a major nutrition impact on SPL is control over energy intake. Overfeeding in gestation is a waste of money, impairs mammary development and reduces lactation feed intake. Underfeeding will cause thin sows with inadequate body reserves. Nutrient requirements during gestation are for maintenance, but body composition is altered after farrowing, and sows have different fetal and uterine needs. During lactation, it's important for sows to maintain body weight, provide adequate milk their litters, and be in proper condition to breed again.

A speaker on the subject of training workers showed innovative training tips to greatly improve performance of stockpeople and improve retention of good employees. There are many new pocket guides available as well as wall charts on reproductive soundness and feet and leg soundness. Producers using these tools can do a better job of selecting replacement females, which will reduce forced or involuntary culling.

The results of the presentations and discussions at the Sow Productive Lifetime Conference, along with current research results, will be used to develop a Sow Management Guide that pork producers can use in their operations.

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MANITOBA: Research shows sows housed on straw perform longer than sows housed on concrete

06.dec.07

Farmscape Episode 2674

Research at the University of Manitoba's National Centre for Livestock and the Environment shows the longevity of sows housed on straw tends to be better than that of sows housed on partially slatted concrete floors. Scientists at the National Centre for Livestock and the Environment are comparing the conventional partially slatted concrete floors to an alternative straw based system, looking at animal behavior, health and production performance.

University of Manitoba Department of Animal Science head Dr. Laurie Connor reports culling rates in the group housed on concrete have been about ten percent higher than in the group housed on straw.

“Performance wise, after about a year and a half now, they seem to be very similar. But, if we look closely at the sows, what we're seeing is that things like culling rate are higher within the conventional solid floor system and it seems that the majority of those are associated with foot, leg, joint types of problems that are probably a combination of the actual type of flooring type of environment. There's no cushioning like there is on straw and also, when the sows are grouped together, those that are on the concrete type of floor, if they're going to scrap a bit, there's more opportunity for them to hurt themselves. Also, since there isn't really much else for them to do, we do have a few chains hanging down for them to chew on but there isn't the straw as there is in the other barn for them to actually occupy themselves so sometimes they're fighting and disagreements will go on for a bit longer. In the alternative barn when those sows are mixed together they tend to very rarely fight. They do spend a lot of time just chewing on straw and just checking out the environment.”
Dr. Connor notes the most of the culling of sows in the conventional group was due to physical problems, joint and leg lameness, while most of the culling in the straw based group was due strictly to reproductive considerations.

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Best Possible Production Practices Best Defense Against Spread of Disease
Source: December 4, 2007 Farmscape.Ca, Bruce Cochrane

The Western College of Veterinary Medicine suggests maintaining the best possible production practices is the first line of defense against the spread of disease in the swine nursery barn. Disease conditions in the nursery barn fall into three groups, postweaning diarrhea, respiratory diseases which may be accompanied by wasting and diseases that result in septicemia and may be manifested as convulsions or meningitis, possibly arthritis or sometimes just sudden death. Western College of Veterinary Medicine Associate Professor Dr. John Harding notes direct pig to pig contact after weaning is a common way of spreading disease and, in some cases, disease may be spread from the sow to the piglet but stock people can often be responsible for spreading disease.
“Producers or technicians enhance disease spread by many common activities that they conduct while they do their daily jobs. One could be walking from pen to pen and transmitting diseases that may be spread through manure in boots. Another way could be in handling pigs. That would be more common probably in the young pigs where they pick up a sick pig and then walk over and pick up a healthy pig so they could be transmitting diseases through their hands. The other way that producers can transmit diseases would be through inappropriate sanitation or not washing or sanitizing the room properly. Perhaps they're rushed

or perhaps they don't understand the processes, haven't been outlined to them. Other things like not having adequate fly control in the buildings then flies or other vectors can spread disease from pig to pig or room to room as well. “
Dr. Harding says producers have several options, the first being good production practices including the segregation of unhealthy pigs into hospital pens and appropriate treatment. He also recommends making sure ventilation is working properly to maintain the best possible air quality and all in all out production.

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Housing, husbandry and animal health and welfare in fattening pigs
By the European Food Safety Authority (EFSA). Opinion of the Scientific Panel on Animal Health and Welfare on a request from the Commission related to animal health and welfare in fattening pigs in relation to housing and husbandry.
October 2007
The PigSite.com

Summary
Council Directive 91/630/EEC , as amended, laying down minimum standards for the protection of pigs, requires the Commission to submit to the Council a report, based on a scientific opinion of the European Food Safety Authority (EFSA), concerning the welfare various aspects of housing and husbandry systems for farmed pigs. EFSA has therefore been required to provide a Scientific Opinion on several aspects of this, one concerning fattening pigs. The opinion should include: the effects of stocking density, including group size and grouping methods, space requirements and the impact of stall design and different flooring types taking into account different climatic conditions.

The Scientific Opinion was adopted by the Panel on Animal Health and Welfare (AHAW) on 6 September 2007.

Based on the scientific data presented in the Scientific Report and risk assessment, conclusions and recommendations were drawn. In relation to disease, respiratory and gastrointestinal infections and production-related diseases can have a major impact on the welfare of fattening pigs. Management, inspection and other disease prevention measures, handling, hygiene, floor type and the manure system have major effects on disease risk and significant importance for ensuring good welfare. At post-mortem slaughter inspection, pigs kept outdoors usually have a lower prevalence of lesions due to respiratory infections than indoor pigs but higher risk of some internal parasites. Leg disorders, which are caused by a complex of factors including genetic selection and high energy and high protein diet, are a major problem.

Interactions between many aspects of the biological functioning of pigs and effects of housing and management on welfare are described. Without suitable rooting and manipulation materials, pigs are likely to direct tactile behaviour

towards companions using aggression or other causes of poor welfare. Manipulable material makes any floor more attractive for exploration and pigs prefer the presence of straw to an unbedded floor. The provision of appropriate foraging material is difficult in pens with fully slatted floors unless there is automatic shredding in the waste disposal system. If the ambient temperatures are too high, adequate space to separate from other pigs, sufficient contact with a cool floor, access to outdoors, air-flow rates to help evaporation, water on the skin, or more drinking water help to avoid over-heating. In the case of too low a temperature, better insulation of the floor lowers the risk of hypothermia. When there is too little sensory input, because of social isolation, a barren environment or too little light intensity, pigs are likely to show abnormal behavioural and physiological responses. Flashing lights can be disturbing to pigs and poor welfare is also associated with light of a wavelength or intensity that does not allow the pig to discriminate the behaviour of other pigs or materials.

The genetic selection for rapid growth and lean meat without enough consideration of other factors has led to some widespread and serious problems. However, selective breeding to eliminate the halothane gene has improved pig welfare. Poor quality pen design can cause poor welfare in pigs because of parts that cause injury, or disturbance and aggression. If pigs do not have sufficient exercise, there can be adverse effects on bone and muscle development. Dunging behaviour (urination and defecation) is facilitated by design of the housing system and good management. Mixing unacquainted pigs leads to a substantial risk of fighting, injury and production loss.

Recommendations presented in the Scientific Opinion include the need to provide an environment and management so that the negative consequences of poor welfare such as injurious behaviours, physiological problems and immunosuppression, caused in barren environments, are avoided. In this sense, it is recommended that pigs should be provided with manipulable, destructible materials, wallows, lighting of appropriate wavelength and intensity, water of a quality and quantity sufficient for their needs, and a balanced diet with no harmful contaminants. In order to minimise disease in pigs, and hence poor welfare, effective disease preventive and management procedures should be in place. The design of accommodation for pigs should be such that the pigs have sufficient exercise for normal bone and muscle development. There should be further efforts to select and breed so that problems of pig welfare, including cardiovascular malfunction, risk of early death and leg disorders are maintained at a low level.

The recommendations for further research are mainly focused on the evaluation of the effects of the exposure to several factors (i.e. barren environment, light intensity, noise, respiratory disorders) on the welfare of fattening pigs. Recommendations for further research in relation to the heavy pig production are also provided. The methodology and the results of this scientific report and

opinion should be developed to identify welfare outcomes (indicators) that are valid and can be used in an animal welfare monitoring system.

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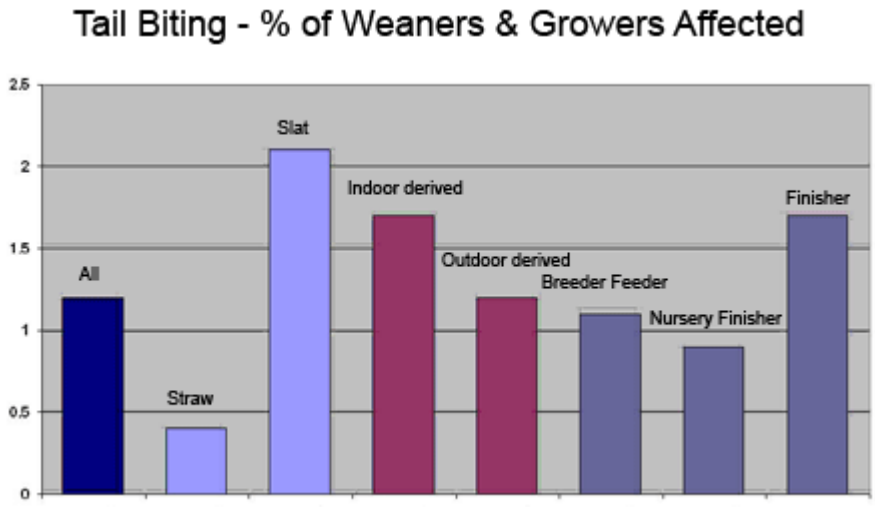
Tail biting: Vice with a £10,000 or more price tag
National Animal Disease Information Service Ltd
November, 2007
Thepigsite.com

By NADIS advisers. Aberrant aggressive behaviour in pigs is widely referred to as vice. In the growing pig this can take the form of tail, ear, flank, stifle or even vulval or penis biting. However, tail biting is viewed as the most widespread and serious of these problems.

NADIS monitors disease on pig farms on a day to day basis via a network of 14 specialist pig veterinary surgeons - has data to suggest that across the monitored population of close to 400,000 growing pigs, in the last three months the prevalence of tail biting is 1.2 per cent and that the prevalence in different systems highlights the widespread nature of the problem. No one system of pig keeping is immune from tail biting. Slatted systems have seen a prevalence of 2% of pigs affected whilst on straw the figure is only 0.4 per cent. Indoor derived growing pigs are 50 per cent more likely to be tail bitten than those born outdoors. Damage to pigs tails by pen mates contributes a major loss to the pig industry.

Tail biting tends to be seen in a number of different scenarios ranging from a constant low grade problem in a continual production unit to explosive outbreaks in batches. As such, the incidence is highly variable. In the former scenario, 3-5 per cent of pigs may be affected week in week out and it would be common place for 1 per cent to require euthanasia and a similar proportion to be condemned at slaughter (usually referred to as “pyaemia” on a condemnation sheet). At this level, the cost to a 300 sow breeder feeder farm can be £10,000 per year (140 pigs per year lost) plus the costs of treatment, care, isolation and lost growth.

In a batch systems, losses as high as 30 per cent of pigs have been experienced – out of a batch of 700 pigs, 208 either died, were destroyed or were condemned at slaughter!



Natural behaviour or vice?
Pigs have a natural tendency to chew. They are also attracted to blood and once biting has started it tends to be infectious. In addition, pigs undergo teeth changes between 3-4 weeks of age and 7-8 months. Anyone who has reared children will recognise the desire to chew during teething and this may be a component of piglet behaviour. Normal inquisitive investigation with the mouth can lead to “accidental” bleeding, which can lead to more serious damage.

In any given situation where tail biting occurs, there is a need to undertake a full investigation and assessment to identify the possible trigger factors. In many cases, a single rogue animal can be identified that has started the problem in a group – usually the smallest pig – although if not spotted early this animal may get lost in the group that join in. A huge range of environmental, dietary and husbandry factors have been identified as acting as triggers for tail biting, ranging from stocking rates, temperature variation, competition for food and water, to Vitamin E deficiency and high fat diets. Professional veterinary advice is essential to unravel the significant factors and identify the cause of “unhappy pigs”. Unfortunately, the “perfect” system has not been identified and, even if it could be, there are always likely to be cost constraints that will compromise its adoption! It, therefore, unfortunately must be accepted that tail biting is a consequence of farming pigs and producers should attend to the basic biological needs of the pig to minimise the risk of damage.
Such areas for consideration include:-
Thermal comfort :- draughts, temperature variation, chilling and over-heating are highly significant factors.
Freely available feed and water – the pig that is unable to get to a free supply of feed and water is always more likely to seek revenge on its penmates.
Feed diets that are appropriate to the pig and contain a full balance of nutrients.
Stocking density. Space provision should be determined by the nature of the accommodation and the requirements of the specific pigs. The Welfare of

Farmed Animals Regulations (2003) (the successor to The Welfare of Livestock Regulations 2000 & 1994) have done a great disservice to the pig.

Fig 1: Severely tail bitten pig requiring euthanasia

Fig 2: Alcathene piping can be a useful toy for pigs on slats

These regulations state the minimum space requirements for pigs of different weight. Putting aside the nonsense of a stepped graph (pigs of 19 and 20kg require the same space but those of 21kg require 50% more!) these minimum requirements have been interpreted as the optimum requirements. (A similar view is taken throughout Europe).

Producers must be aware that these figures were not based on any sustainable science and, as such, are totally meaningless to the true needs of the pig.

Concommittant disease is a major trigger of outbreaks of tail biting. The complex pathological and physiological factors brought into play by major systemic disease such as pneumonia, scour and wasting cause malcontent and aggression to develop, and tail biting is a common consequence.

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POULTRY

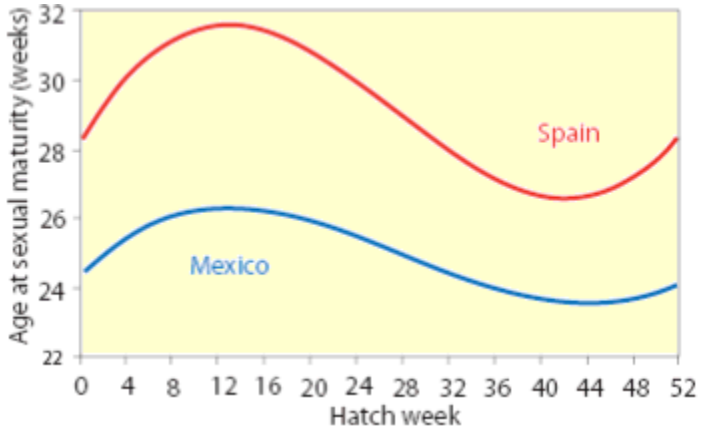
Daylength for broiler breeders – have we got it right?
By Dr Peter Lewis, Consultant.
The PoultrySite.com
October 22, 2007

Research suggests that the right lighting pattern for egg-laying hens will not necessarily get the best results from breeders. From the start of the broiler industry in the 1950s, recommendations for lighting breeders have invariably been based on programmes designed for lighting egg-laying hybrids. Typically, these involve an initial period of long days followed by a step-down programme to reach 8 hours by 1-2 weeks of age. The birds are held on 8 hours until about 20 weeks and then transferred to a 10-, 11- or 12-hour day to initiate egg production, followed by a series of weekly increments to reach a maximum of 15 or 16 hours. The reason for the dependence on egg-type lighting programmes

has been the minimal amount of research into the broiler breeder's response to light, presumably because it was assumed that it would respond similarly to its lower bodyweight, egg-type cousin. However, in recent years fundamental research conducted at the University of KwaZulu-Natal in South Africa has shown that broiler breeders cannot simply be regarded as large chickens and may, in some aspects, be better treated as if they were small turkeys. So what have we got right with broiler breeder lighting, and where do we need to make changes?

Controlled environment in the rearing period.
The most important finding of the recent research has been that broiler breeders, unlike egg-type hybrids, still retain a vestige of seasonal breeding. Indeed, surveys of performance in two broiler breeder industries (Mexico and Spain) have shown that despite flocks being grown to typical breeder company bodyweight targets and lit according to their recommendations, they still show a pronounced seasonal variation in the age at which they come into lay (Figure 1). It will be seen that the range is wider in Spain because of the bigger difference between the shortest and longest days at higher latitudes. A characteristic of seasonal breeding birds is that they are unable to respond to a stimulatory daylength when they hatch. Instead, they require a period of short days before they can respond to a transfer to longer days. As a consequence, spring-hatched birds, which have never received less than 12 hours light, are generally the latest flocks to mature. Those that hatch in the autumn will be the earliest to start egg production because they will have experienced the short days of winter during the rearing phase. In nature, this inhibitory mechanism, termed photorefractoriness, stops birds coming into lay in the autumn. This is because food will be scarce, and cold winter conditions will reduce the progeny's chances of survival.

Figure 1: Effect of hatch date on sexual maturity in broiler breeders kept in the northern hemisphere (subtract or add 26 to produce hatch dates for southern hemisphere flocks).

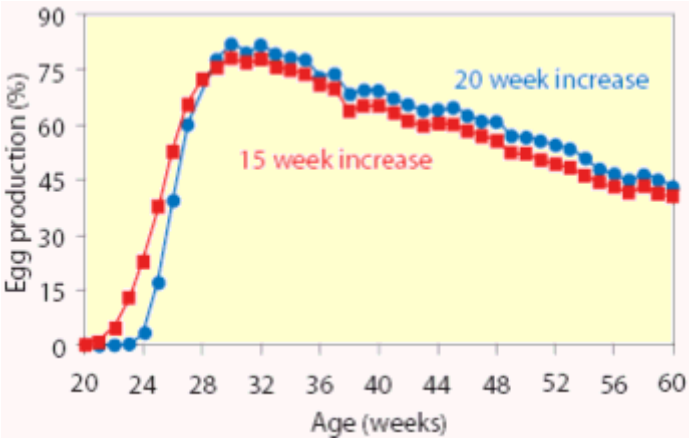


Turkeys are seasonal breeders and typically need about two months of short days (mimicking winter) at the end of the rearing period to make them responsive to a light increase. However, in contrast to turkeys, broiler breeders are control-

fed during rearing. This not only slows up their growth but also delays the dissipation of the refractory condition. As a result, they require more like 5 months of short days before they can be successfully stimulated into egg production with a light increase.

Our research in South Africa has also shown that photostimulating broiler breeders much before 19 weeks – even if feed restriction during rearing is relaxed – is likely to result in a flock of birds being sexually uneven and having a low peak, poor persistency, and variable egg weight. The egg production data in Figure 2 shows the slow entry into egg laying and low peak for birds photostimulated at 15 rather than 20 weeks of age, even though each group was grown to achieve the same bodyweight (2.1kg) by the time of the light change.

Figure 2: Egg production for 2.1kg body weight broiler breeders given an increase in daylength at 15 or 20 weeks.



There is little difference in the age at which egg production begins when birds are reared on 6, 8 or 10-hour days and transferred to 16-hour days at 20 weeks. So it seems that there is little wrong with the current recommendation to rear broiler breeders on 8-hour days prior to a transfer to long days at about 20 weeks of age (Table 1).

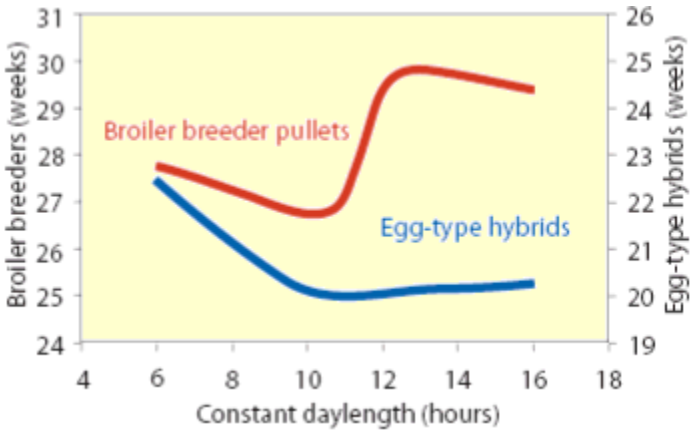
Performance Of Broiler Breeders On 6, 8, or 10 Hour Daylengths And Transferred To Sixteen Hours At Twenty Weeks

Daylengths During Rearing (Hours)	Age At 50% Egg Production (Days)	No Of Eggs To 60 Weeks Of Age	Average Egg Weight (g)
6	196	161	68.1
8	193	169	67.5
10	196	171	68.4

Non-lightproof or open-sided housing in the rearing period

Contrastingly, the advice to rear spring-hatched birds that are kept in open-sided or non-lightproof housing on a daylength equal to the longest anticipated natural daylength is incorrect, even though this continues to be an appropriate lighting policy for rearing commercial egg layers. Broiler breeders that are never exposed to short days take much longer to become responsive to an increase in daylength. Indeed, those reared on long days take about 3 weeks longer to start egg production than birds reared on 8-hour days and never photostimulated. This is completely opposite to the response of egg-laying birds (Figure 3). A further problem when broiler breeders are given long days during the rearing period is that it leaves little opportunity to photostimulate them when they are moved into the laying house.

Figure 3: Age at 50% egg production in broiler breeder and egg-type hybrids kept on constant daylenghts



In one of the trials in South Africa, we compared three different lighting programmes during the rearing period:

- a naturally increasing daylength from either 10 or 11 hours to 14 hours
- a decreasing schedule from 14 hours down to 10 hours, or
- a constant 14-hour daylength.

There was only 3 days difference between the various treatments in the time taken to reach 50% egg production after they had all been transferred to a 16-hour day at 20 weeks. This demonstrates the dominant role that the feeding programme plays in the control of sexual maturity in broiler breeders. However, the failure to provide the 14-hour birds with any short days meant that this group had very poor persistency; some birds will have gone out of lay, and overall, they laid 6-10 fewer eggs to 60 weeks than the groups reared on the simulated natural lighting programmes (Table 2). For seasonal breeding species that are held on long days, the greater the delay in the start of egg production means they go out of lay sooner at the end of the breeding season.

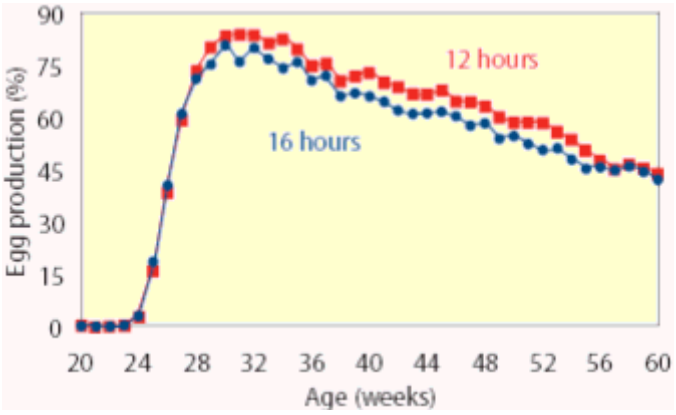
Performance Of Broiler Breeeders Reared On Simulated Naturally Increasing Or Decreasing Daylengths Of Constant 14 Hour Days Before A Transfer Of 16 Hour Days At 20 Weeks

Lighting Programme To 20 Weeks	Age At 50% Egg Production (Days)	No. Of Eggs To 60 Weeks Of Age	Average Egg Weight (g)
Increasing From 10-14 Hours	209	150	170.0
Increasing From 11 To 14 Hours	210	146	69.8
Decreasing From 14 To 10 Hours	209	150	69.4
Constant 14 Hours	212	141	68.9

Controlled environment in the laying period

Egg production over the laying cycle when broiler breeders are given a single increase from 8 to 16 hours at 20 weeks of age is inferior to that when they are transferred to only 12-hour days. Data in Figure 4 from a trial conducted in South Africa show that birds transferred to 16 hours came into lay slightly earlier than 12-hour birds, but had poorer egg production after peak, which resulted in the production of 10 fewer eggs to 60 weeks of age.

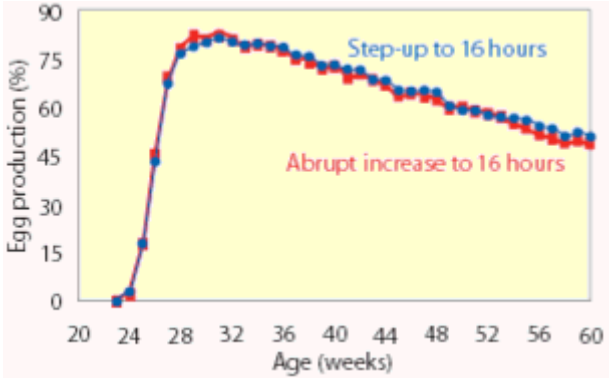
Figure 4: Egg production for broiler breeders abruptly transferred from 8 to 12 hours or from 8 to 16 hours at 20 weeks.



Other birds were transferred to 12 hours at 19 weeks then given four further increases to reach 16 hours at 23 weeks. Their egg numbers to 60 weeks were similar to those for birds changed to 16 hours in a single increase at 19 weeks. However, there were differences in the pattern of egg production, as occurs in

egg-type hybrids: birds that were abruptly increased came into lay slightly earlier and had a higher peak rate of lay than birds that had been given the gradual increase. However, the latter group had better egg production at the end of the laying period (Figure 5).

Figure 5: Egg production for broiler breeders given a single increase from 8 to 16 hours at 19 weeks or an initial increase to 12 hours then a series of further increases to reach 16 hours at 23 weeks.



These findings suggest that broiler breeders do not need to be given 15 or 16-hour daylengths (as recommended by most breeding companies); a single transfer to 12 hours will be adequate for maximum egg production. Laying hens require 1% more energy per hour when they are in light than when they are in darkness. When broiler breeders are given a fixed daily amount of feed and 12 hours of light, they will have 4% more energy available for egg production than birds given 16 hours light.

Non-lightproof or open-sided in the laying period.
It is probably sensible to give broiler breeders a 16-hour day in the laying period when they are kept in non-lightproof accommodation. This gives more opportunity to photostimulate (albeit minimally) birds when they are transferred to the laying house in mid summer, and avoids a decrease in daylength after the longest day.

Lighting of males
Research has yet to be concluded on the response of males to lighting. Preliminary results suggest that males respond to a lighting programme in a similar way to females. That is, they also require a 4-5 month period of short days during rearing and should not be photostimulated much before 20 weeks of age if uniform sexual maturation is to be achieved.

What's wrong…what's right?

- The recommendation to rear broiler breeders that are kept in controlled environment housing on 8-hour days and transfer them to 11 or 12 hours is sound.

- The breeders' advice to photostimulate at 20-21 weeks is absolutely correct. This ensures that, within a flock that has been grown to reach 2.0-2.2kg by 20 weeks, all birds will be able to respond to an increase in daylength.
- When birds are reared in non-lightproof (open-sided) accommodation, it is probably better to expose them to naturally changing daylengths than to rear them on a constant long day.
- It is unnecessary to continue increasing the daylength to 15 or 16 hours in a lightproof laying house; 12 hours is perfectly adequate for maximising egg production.
- 16-hour daylengths need to be given to birds kept in open-sided or non-lightproof housing at high latitudes, but this can be reduced to 14 or 15 hours to match the longest natural daylength at lower latitudes.

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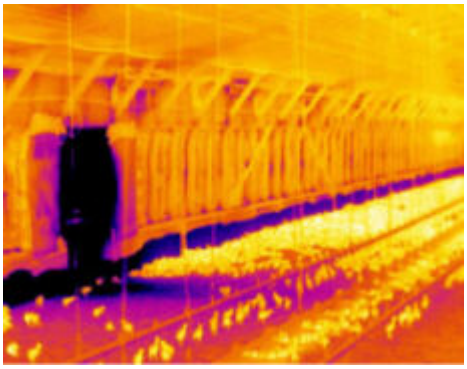
Breeder House Ventilation Principles
By Aviagen. With this article Aviagen is continuing the series about the successful management of Ross flocks. Here we discuss effective ventilation of the breeder house.
The Poultry Site
October 29, 2007

The primary goals of effective ventilation are to remove excess heat and moisture, provide oxygen while removing harmful gasses maintaining air quality in the house. When house ventilation is set up incorrectly the systems can struggle to achieve the primary goals and performance and health status of the breeder flock will all suffer.

The design and set up of the ventilation system should take into account the external environment. In the CIS region the most appropriate ventilation is usually provided by a conventional fan and inlet system. However during hot weather tunnel ventilation can be an invaluable aid to bird management.



Pic.1. Cold spot near leaking fan shutter.
Picture courtesy of M.Czarick,

UGA

The basis for good control of the environment firstly is to ensure that air only enters the house through the inlets. It is important that fresh (cooler) air coming into the house is well mixed with the stale (warmer) air already there. One of the common problems in ventilating houses that are poorly sealed is low static pressure. This causes the incoming air to travel too slowly, which means cold heavy incoming air (especially in winter time) drops to the floor, dumping water vapour in the litter as it does so. If the house is not sealed, air will enter the shed footers, around doors, Poor ventilation management shows itself in pockets of dead air, drafts, cold spots, or hot spots (caused by poor house insulation); it will cause poor flock performance and may even cause mortalities (Pic. 1). To avoid a dropping air stream in very cold weather, static pressure may be increased up to +10% from standard to increase air speed. Vent box inlets are available which are automatically adjusted by computer which monitors static pressure.

All thermometers or thermal sensors or thermostats need to track temperature at bird level. What matters is what is being experienced by the birds, not by the manager or even by a thermometer; especially one mounted four feet above bird level.

Pic. 2. Laying nests placed across the direction of airflow will limit the efficiency of tunnel ventilation'

A common ventilation error is that managers are often nervous of ventilating younger flocks particularly during cold and humid weather. It's important to realise that during cold weather moisture coming into the house with outside air and the amount of house heat lost during minimum ventilation is insignificant compared with the benefits gained in bird performance. Cold air can't hold much moisture, and as it is warmed by good mixing with the house air its relative humidity will drop. This enables the ventilation air flow through the house to absorb and exhaust excess moisture and harmful gases. Thus we can and must operate minimum ventilation rates even during the harshest of external climates.

Another common mistake is seen in operating transitional or tunnel ventilation modes. In judging the time and need to switch to tunnel ventilation, we must keep

the wind-chill effect in mind. Air speed in tunnel ventilated houses is fast enough to cause significant wind chill. This is completely inappropriate for young breeding stock, or when the outside temperatures are cold. If we are switch into tunnel mode inappropriately, the birds will experience a drop in the "apparent temperature," which may be quite a bit lower than the thermometer reading. When birds are young and sensitive to wind-chill, the effective temperature drop will feel like a blast of cold air and be difficult for them to cope with. Equally in hot weather and for mature birds, the wind chill effect can help keep the birds comfortable and laying normally. One common problem with operating tunnel ventilation is when all the tunnel fans are in use but they are struggling to achieve the required air velocity of 2,5 meter per second at bird level over the whole house (which is needed for most effective wind-chill cooling).

The most often reasons for that are the following:

- Air entering the shed from points other than the designated air inlet at the end opposite to that of the fans
- Inlet area is too small for the number of fans running (static pressure too high and fans struggle to move volume of air) or fan capacity is not enough - static pressure drops too low.
- Having any obstructions to airflow being placed directly in the airstream. For example, pen barriers, sealing cross-beams or nest boxes orientated perpendicular to airflow (Pic. 2).
- If fans blades, shutters, bird protective nets or cooling pads are dirty, or fan belts are worn or loose, the air-moving capacity of fans can be reduced by 30%. As a result the static pressure will drop and airflow will be reduced (Pic. 3).

Pic. 3. Dirty bird-protective net resists airflow and strains fan capacity.

It is useful to remember that pen partition fences with small mesh size and light baffle hoods can also decrease static pressure in the house as they impact on the efficiency of the fan and can reduce exhaust fan performance giving the illusion that the house is less air tight than it really is. Pay your attention to this, when assessing the house. Integrated electronic control systems now make the management of ventilation easier, since they can automatically switch modes and adjust ventilation rates as conditions change. It is important to remember the smartest controller is not infallible, and must be monitored. Even more important,

the controller settings themselves must be determined by a knowledgeable stockman. There is just no substitute for a good poultry man who is in the house frequently, watching the birds and making the control adjustments they need for best performance.

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Nipple Drinkers for Brooding Turkeys
The Poultrysite
November 19, 2007
By Jesse L. Grimes, Department of Poultry Science, NC State University; Summer Russell, Prestage Farms, Inc and published in the North Carolina Poultry Industry Joint Area Newsletter - Fall 2007.

The use of nipple drinkers for rearing broilers has become common. However, the use of nipple drinkers in the turkey industry is restricted to the brooding period except for some trials and certain drinker types with commercial hen and tom grow-out. Even during the brooding period, there are many questions about what is the best type of drinker and optimal age of transfer to grow-out (or to open drinkers). With that in mind, we planned research trials to provide information concerning the use of nipple drinkers for brooding turkeys.

There were six different drinkers tested including the control and five nipple drinker systems. The control was the Plasson Turkey Bell and the nipple drinker systems tested were the Plasson Easy Start, Valco Turkey Drinker, Lubing Traditional (commercially known as Feather- Soft® high flow nipple with Littergard®), Lubing Easy Line, and Ziggity Big-Z Activator. For the most part, the birds were brooded on the test drinkers and switched to the bell drinker at six weeks of age for the remainder of the growing period. Three experiments were conducted with Large White commercial turkeys brooded using six drinker types.

In Trial 1, sixweek body weights of toms brooded on the Plasson Easy Start and the Ziggity, Big-Z Activator were less than the body weights of those toms brooded on the Plasson Bell. Differences in body weight due to drinker type remained through 10 weeks of age. At 20 weeks, body weights of toms brooded on the Lubing Traditional Nipple and the ValCo Turkey drinker were significantly lower compared to body weights of toms brooded on all other drinkers. There were no differences in feed conversion by drinker type until 20 weeks of age when birds brooded on the Lubing Traditional nipple and the Lubing Easy Line had lower (improved) feed conversion.

Trial 2 with hens was terminated at three weeks because of excessive mortality. Hens of two strains brooded with the Easy Line did not show a desire to find the water which is typically located in the bottom of the drinker well. One strain, in particular, demonstrated less activity than the other strain and experienced high mortality on all drinkers but especially on the Easy Line drinkers.

In Trial 3 with hens, plastic “brooder” balls provided by Lubing were added to the wells of the Easy Line drinkers. There were no issues with the poults finding the water in this trial nor was there any problem observed in the tom trial where the plastic balls were not used.

Body weight of hens brooded on the Plasson Bell and the ValCo Turkey drinker was higher compared to body weights of hens reared the Plasson Easy Start and the Ziggity, Big-Z Activator with the body weights of hens on the Lubing EasyLineTM being intermediate at six weeks. The Lubing Traditional Nipple yielded significantly lower hen body weight compared with all other drinkers through 10 weeks of age. By 16 weeks of age, there were no longer differences in hen body weight due to drinker type. Drinker type did not have a significant effect on hen feed conversion.

The use of nipple drinkers for turkey rearing has shown mixed results. Hulet (1999), in Pennsylvania, reported that nipple drinkers were effective in brooding conditions or up to 10 weeks of age. However, the results of his study resulted in reduced body weights with comparable or improved feed conversion. Similarly, in a field trial with commercial birds in North Carolina reported by Rives (2001), body weights seemed to be reduced at 5-6 weeks, but were stabilized by 10-12 weeks of age when the birds were put back on the Plasson Turkey Bell drinkers for the grow-out phase. In our study, like the Rives (2001) field trial, we found that birds experienced compensatory growth when put back on the Plasson drinker. We (for our studies) and Rives (for his field trials) concluded that a combination of the two drinker types may be optimal in certain instances. For example, in our study, birds which were brooded on the Plasson Easy Start and Ziggity and then switched to the turkey bell performed as well as the control birds. However, some new systems seemed to work well for the entire life of the flock. For example, birds on the Lubing Easy Line, which remained with the birds throughout the study, exhibited comparable performance to birds on the conventional Plasson Turkey Bell.

In general, turkeys brooded on nipple drinkers can experience decreased body weight, improved feed conversion, and improved bird health. In some cases, this reduced body weight during brooding can be made up during the rearing phase. Hulet (1999) noted many advantages of nipple drinkers that can offset the disadvantage of reduced body weight. On a performance basis, even though body weight is reduced, feed conversion can be improved, and overall bird health can be improved due to the access to clean, less contaminated drinking water. Since nipple drinkers are a closed system, their use can result in drier litter which also contributes to improved growing conditions. Practically speaking, nipple systems provide growers with a labor saving alternative to traditional open-water systems especially since nipple drinkers need less cleaning. However, the water lines themselves still need regular cleaning and maintenance. As observed in our studies, some systems, whether they be new or improved, may result in

comparable growth rates, improved litter quality and reduced grower labor depending, in most cases, on how they are used and managed.

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Optimizing the Performance of Early Nutrient Restricted Offspring From Young Broiler Breeders

By David Peebles, PhD Professor, Poultry Science, Mississippi State University, published in MSU Poultry Dept. Newsletter Vol. 1 Issue 3.
November 2007

The poor quality and excessive mortality of chicks during the first 7 days of brooding are frequently associated with smaller chicks from smaller eggs (inherent to flocks of young breeder hens 30 weeks of age or younger) that have been subjected to an improper hatching process, delayed brooding, or poor brooding management.

The loss of body fat, muscular regression, and kidney damage in these chicks parallels in-creases in early embryo mortality between days 1 and 12 of incubation. Internal body temperature and plasma refractive index are physiological parameters that are indicative of the metabolic and growth rates of embryos and chicks. These parameters are important “marker” parameters, because when they are abnormal, they will signal the poultry producer to the possibility of a subsequent increase in mortality. When elevated, plasma refractive index is indicative of dehydration, while a low internal body temperature reflects a depressed metabolism. These two specific parameters have been shown in earlier studies to have potential value for the prediction of later performance. However, the age-dependent relationships among these and other “marker” parameters in embryos and chicks, from breeder flocks at 30 weeks of age or younger, are largely unknown.

Understanding the association and predicting the onset of changes in these parameters would allow hatchery and grower personnel to make appropriate adjustments in their management to accommodate the negative impacts of earlier environmental influences and to optimize performance. In addition, no previous work has addressed the influence of prolonged delays in brooding and the impact of its duration on the relationship of these parameters to the health, viability, and welfare of chicks. These relationships are a major concern of primary breeders, particularly those that transport chicks internationally. Industry personnel must be knowledgeable of established parameters that are essential in defining the well-being (hydration and energy status) of their chicks when confronted with welfare issues.

Our laboratory is interested in understanding the relationships among these metabolic and growth-related parameters across incubation and brooding, and to know their critical levels and physiological and molecular bases. More

specifically, we further seek to establish the time-dependent changes and relationships between various physiological and molecular parameters in broiler embryos (during the last week of incubation) and in chicks (through 72 hours post-hatch) from very young hens before, during, and after prolonged delays in brooding. In addition to body temperature, plasma refractive index, and other blood and visceral parameters, incubation temperature, egg temperature, incubational egg water loss, eggshell conductance, bird sex, time of hatch, hatchability, and embryo and chick growth and mortality are also under consideration. Trials are underway to establish the repeatability of the results in industry settings and to provide procedures by which to test for the various metabolic indices in both incubating embryos and chicks for practical application.

Other research in our laboratory has extended into the determination of the effects of the commercial egg injection of various nutrients at transfer on the viability of the embryo and chick, and their effects on the various physiological factors described above. These materials would be injected in conjunction with the normal injection of the Marek's vaccine. The US Broiler Industry produces 8 billion or more broilers per year. Therefore, understanding and alleviating early chick mortality by as little as 0.25 % could result in a realized annual savings of over $5 million in chick costs to the industry. Much greater benefits in subsequent broiler performance, however, may be realized. Therefore, such measures as described in our research could significantly increase profits to the commercial broiler industry that exceed $20 million per year.

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Hen's May Not Care for Freedom
December 20, 2007
ThePoultrySite News Desk

ATLANTA - Animal rights activists have long alleged that hens in modern cages live a horribly stressed life, but new research appears to debunk those claims. Researchers have discovered that free range hens experience just as much or more stress than hens raised in modern, conventional cages.

A recent study conducted by Jeff Downing at University of Sydney measured corticosterone, a hormone produced in response to stress or fear, in eggs from free range and modern caged hens. The study showed that the levels of the hormone were similar in both types of eggs. Free range hens deal with pressures that hens in modern cages do not, researchers explained. For instance, hens in modern cages are protected from outside predators, while free range hens are not. "They are constantly in fear of attack by predators," said Downing. "A shadow (a bird flying overhead) comes over and they are completely startled."

Hens in modern cages also are protected from many of the manure-borne diseases and parasites that affect free range hens. And hens in modern cages

are protected from extreme weather which adds stress to free range hens which are not protected. Modern cages also help prevent infection and spread of the avian influenza virus which can affect wild birds and outdoor flocks of hens. Free range eggs can cost up to three times as much as conventional eggs.

"This study confirms what America's egg farmers already knew," said Gene Gregory, president of the United Egg Producers, the nation's leading trade association for U.S. family egg farmers. "That well-run, clean modern cage housing systems have many benefits for hens as well as consumers." Separate research studies also show that hens raised in conventional cages tend to have fewer diseases and live longer, Gregory added.

Modern egg production under the UEP Certified animal welfare program provides hens with nutritious food, clean water, fresh air and sufficient space to allow hens to stand, turn around, lie down, stretch and preen. Farms are inspected annually to ensure compliance. Consumers should look for the UEP Certified logo on cartons from participating farmers. UEP developed the UEP Certified program for modern egg production from scientific guidelines established by an independent advisory committee of top animal welfare experts in the U.S.

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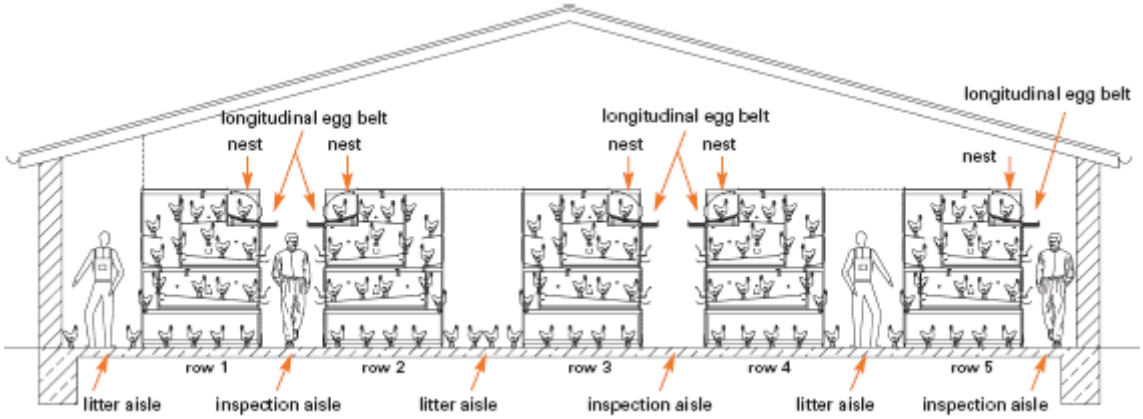
Modern Aviary Design
Big Dutchman looks at a new aviary design system for laying hens
By Chris Harris, senior editor,
ThePoultrySite. .
December 3, 2007

The ability to reduce the effort needed to manage a poultry house for layers together with the ability to increase production and make it more reliable are essential assets for any new design. As no two houses are alike, because their length, width and height can vary, all these needs have to be taken into consideration. Equipment and systems manufacturer, Big Dutchman, has now developed a housing system that is designed to ease the burden on the poultry man and help increase laying production.

The Big Dutchman Natura 60 two-tier poultry house has alternating aisles between the housing rows that allow practical and easy inspection. The help in moving the birds in an out of the area and facilitate daily supervision of the birds as well as easing egg collection. The inspection aisles remain free of hens and litter and do not have any other obstacles such as doors or partitions to hinder inspection. With the aisles free of manure and obstacles, this provides a better working environment for the staff. The nests and the egg belts are positioned above the aisles so that they too are readily accessible. The birds are easily accessed through sliding doors on each side of the row and stairways provide access to different levels in the aviary for the hens. The top tier has perches at

different heights and nipple drinkers for water supply. The hens also have a scratching area beneath the system and the litter area through large openings that run the entire length of the system. Big Dutchman says that the system is completely functional and it can also be installed with just one row in the house.



When the hens are moved into the system, Big Dutchman recommends that it should remain closed for a period to allow the birds to acclimatise themselves to the new environment. The equipment manufacturer says that as feed and water can be easily accessed by using the stairways in the aviary, the hens soon become accustomed to all levels.

System eggs can easily be collected from the egg channel
Bottom: sliding door and separation from the scratching area

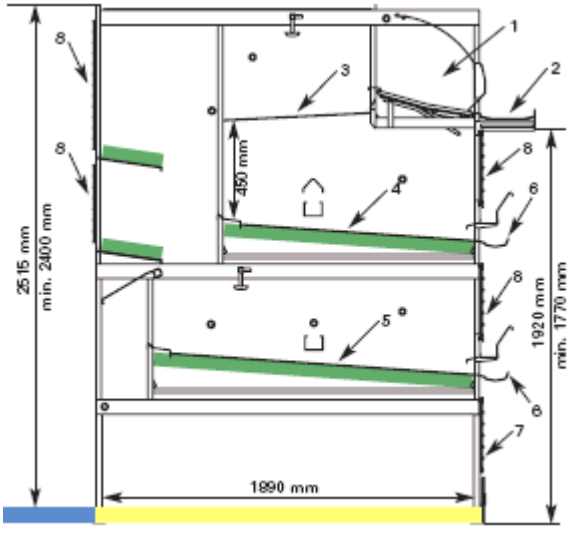
The system has partitions installed at every 2.41 metres to allow for manageable groups of birds of between 130 and 150. This helps to ensure that the nests are used evenly throughout the system from the beginning. The farm staff can inspect the birds by walking the aisles and even at maximum stocking densities there is still plenty of space for the birds because of the various levels of the aviary.

Big Dutchman adds that pullets should already be reared in an aviary type

system, as this is the main condition to ensure a good start to the laying phase and it also helps to reduce stress when the birds are moved into the main aviary system. One the birds are familiar with their surroundings, the system can be fully opened to allow the hens to act naturally - scratching, picking and dust bathing.

The egg belts are installed along the length of the aviary at the upper level and the back wall of the top of the system can be folded back to open up the laying nest. The egg collection belt along the length of the system allows for gentler egg collection.

The ideal stocking density for the Natura60 is easily calculated because on the width of the aisles and the areas outside the aviary vary. In this way buildings of different sizes can accommodate different numbers of aviaries at different densities up to an optimum of 18 hens per square metre of usable area. More rows from one to four increase the possible optimum density building up from 16 birds to 18.



Calculation of hen places

usable area in m2 per running metre...

system	3.56 m
beneath system	1.89 m
litter aisle (variable)	up to 1.22 m
total	up to 6.67 m

6.67 x 9 hens/m2 usable area => max. 60 hens per running metre and row legend

legend
1. laying nest
2. longitudinal egg belt
3. floor in front of the nest
4. usable area with manure belt on 2nd level
5. usable area with manure belt on 1st level
6. egg channel for mislaid system eggs
7. sliding door and separation to scratching area
8. sliding door for simplified bird supervision

House width and number of rows for optimum utilisation of building*

building width inside	number of rows	hens/m2**
3.50 m	1	16.0
6.35 m	2	17.7

*** aiming for 18 hens/m2**
**** building surface area between the end-sets**
In order to be able to offer more flexibility for

9.20 m	3	17.6	**different building widths, the system is also available with a width of 1.61 m.**
12.25 m	4	18.0	
14.85 m	5	18.0	
18.25 m	6	18.0	
21.00 m	7	18.0	
24.40 m	8	18.0	

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Research Focuses on Proper Vaccine Administration Techniques
December 2007
By Mississippi State University, published in MSU Poultry Dept. Newsletter Vol. 1 Issue 3.

Numerous methods are currently utilized throughout the poultry industry for the administration of vaccines. Vaccine delivery to birds in commercial poultry houses occurs via three predominant methods: drinking water, eye drop or spray. Spray administration often results in non-uniform application and inconsistent response by the birds' immune systems, however, it is desirable for both ease and cost of application. Spray vaccination is the preferred method for inoculating the respiratory system of poultry, but non-uniform and inconsistent vaccine administration can result in a "rolling reaction" within a flock which in turn can result in longer recovery with the overall impact of decreased flock performance. Within the commercial table egg sector of the poultry industry, spray application is considered to be the most effective delivery system for the administration of most Mycoplasma gallisepticum (MG) vaccines, and has become increasingly popular for the administration of Newcastle disease virus and infectious bronchitis virus vaccines.

Vaccine delivery systems significantly influence the outcome of vaccination. While improper vaccine ad-ministration is the most common reason for vaccine and vaccination program failure, procedures for the reconstitution/dilution of vaccines for dispersal can also be an important factor in vaccine effectiveness. Essentially, all poultry vaccines, whether administered via drinking water, eye drop or spray, utilize water as both the means of vaccine reconstitution and as the delivery medium. Water characteristics such as pH, tonicity/osmolarity (mineral content), temperature and source (well, municipal or distilled) may impact vaccine effectiveness. Other important factors to consider are spray nozzles, nozzle spray pattern, delivery pressure, the possibility of vaccine suspension/stratification in the vaccinator reservoir and the time from vaccine reconstitution/dilution to final vaccine dispersal to the chicken.

Several recent research projects at the USDA-ARS Poultry Research Unit at Mississippi State have been conducted to study many of these factors affecting vaccine administration in commercial poultry operations. One such experiment focused on the relationship between live MG vaccine viability and the factors of

water temperature and time. Experiments were conducted with 3 commercially available MG vaccines: F strain, 6/85 strain and ts-11 strain. All 3 vaccines were reconstituted in distilled water at 3 temperatures (39°, 72° and 90°F). Survival of the live MG vaccines was assessed after initial reconstitution (0 minutes) and at 15, 30 and 60 minutes post reconstitution. Results indicated that the 6/85 strain MG vaccine remained consistently viable over all time period periods at all 3 temperatures tested. The F strain vaccine viability was most quickly reduced with 90°F water compared to 39 and 72°F water, with significantly reduced viability immediately after initial reconstitution. A similar trend was observed with the ts-11 stain vaccine at 90°F, but not until 15 minutes after mixing. Viability of the ts-11 stain continued to be significantly reduced at 30 and 60 minutes after mixing at 90°F. Overall, the data from this study suggests that distilled water used to reconstitute and dilute live MG vaccines should be relatively cool to maintain and prolong the viability of the organisms.

Researchers have also evaluated additives that can be used to adjust the pH and tonicity/osmolarity of water used to reconstitute vaccines. One such product tested was a reformulation – based on USDA-ARS Poultry Research Unit studies - of Spray-Vacâ, a vaccine additive, manufactured by Animal Science Products, Inc., Nacogdoches, TX. This product was found to be effective for not only MG vaccines, but also viral vaccines such as Newcastle and infectious bronchitis. Spray-Vacâ can be used with distilled, municipal or well water. This product prevents the decline of vaccine titers often seen when vaccines are diluted in chlorinated or distilled water because it helps adjust the pH and counteracts the chlorine in the water that may kill the vaccine organisms. It also colors the water so the user knows for sure the water has been treated.

Additional work has studied the factor of vaccinator delivery pressure and its relationship to nozzle size, which affects both delivery rate and droplet size. Three types of nozzles (coarse, medium and fine) were tested at 40 and 60 psi to determine the droplet sizes generated as well as “as applied” coverage and deposition. The median droplet size ranged from 154 to 192 mm for all combinations of nozzles and pressure, with little correlation to the nozzle classification by the nozzle manufacturer. Very few respirable droplets (<10 mm) were observed for any treatment. Coverage and deposition were greatest for the “coarse” nozzle, followed by the “medium” and “fine” nozzles. Vaccine viability appeared unaffected by any of the treatments tested. The relative similarity of droplet sizes coupled with the disparity of coverage and deposition between nozzle types indicated that delivery rate is of greater concern than droplet size, especially given the negligible amount of respirable droplets observed.

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New cloned vaccine for Newcastle disease
WorldPoultry.net, Netherlands
12 Dec 2007

A new live vaccine for the control of Newcastle disease has been launched by German vaccine specialist, Lohmann Animal Health. Known as AviPro ND C131 and suitable for broilers, layers and breeders, it is produced from a cloned strain of the La Sota virus. Newcastle disease is highly contagious and one of the most devastating poultry dseases, typically resulting in high mortality in infected flocks. According to the company, cloned vaccines have the advantage of being more stable than mixed virus strain vaccines because they contain only one set of 'genetic information'. Batch-related differences decrease giving more predictable performance.

AviPro ND C131 has received European registration and is licensed for use on chicks from 14 days old. It can be administered through drinking water, via spray or by eye-drop. For commercial layers, re-vaccination during the laying period is possible.

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Scientists say bedbugs bed down in chicken breeder houses
Dec. 8, 2007, 12:48PM
The Associated Press

FAYETTEVILLE, Ark. — Arkansas and Texas researchers theorize that certain chicken houses are prime habitat for the bloodsucking bedbug. Scientists at the University of Arkansas at Fayetteville and Texas A&M are studying the DNA of the flightless insect famous for infesting bed mattresses and pestering people as they try to get a good night's sleep. Arkansas entomology professor C. Dayton Steelman, who collects laboratory samples, says bedbugs hide during the day but come out at night to feast in breeder houses where hens lay eggs for hatcheries. "They're usually in there by the thousands, maybe even millions, before they're detected," he says.

The scientists believe the breeder houses are "geographic epicenters" from which the bugs migrant to other parts of the country by traveling poultry workers and by other birds, such as swallows that nest in the houses. James Austin, a scientist at Texas A&M, says the spread of rapid transit and global travel also most likely have helped bedbugs multiply. Mature bedbugs are about a quarter-inch long. They are reddish-brown and have a broad, flat body. The bugs apparently favor breeder houses because the insects can get to the hens as they lay in nest boxes, producing eggs used in hatcheries to supply chicks for chicken farms.

The bugs aren't as plentiful in houses that produce eggs sold in grocery stores because the chickens in those houses are kept in cages suspended over the

floor and the bugs can't jump that high. Standard chicken houses with birds bound for processing plants also aren't easy marks for bedbugs because the chickens cycle through quickly, and the houses are cleaned after each cycle.

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FISH

Blow for fans of boiled lobster: crustaceans feel pain, study says
Ian Sample
The Guardian (UK)
Thursday November 8 2007

Sensitive chefs, avert your eyes now. An investigation into the most contentious of kitchen dilemmas has reached its unpalatable conclusion: lobsters do feel pain. The question of crustaceans' ability to experience pain has become an unlikely obsession for some scientists. Over the past few decades, the question has been batted back and forth as fresh evidence comes to light. Two years ago, Norwegian researchers declared the answer was a firm no, claiming the animals' nervous systems were not complex enough.

The latest salvo, published in New Scientist today, comes from Robert Elwood, an expert in animal behaviour at Queen's University, Belfast. With help from colleagues, he set about finding an answer by daubing acetic acid on to the antennae of 144 prawns. Immediately, the creatures began grooming and rubbing the affected antenna, while leaving untouched ones alone, a response Prof Elwood says is "consistent with an interpretation of pain experience". The same pain sensitivity is likely to be shared by lobsters, crabs and other crustaceans, the researchers believe. Prof Elwood says that sensing pain is crucial even for the most lowly of animals because it allows them to change their behaviour after damaging experiences and so increase their chances of survival.

The claim will add weight to campaigns by animal rights organisations which protest against lobsters being boiled alive. But conscientious eaters need not, necessarily, abandon lobster. Other scientists believe the debate is far from over. Many think only vertebrates have advanced enough nervous systems to feel pain, and suspect that the prawns' reaction to having acid daubed on their antennae was an attempt to clean them. "Shrimps do not have a recognisable brain," said Lynne Sneddon, a Liverpool University researcher who has studied pain in fish. "You could argue the shrimp is simply trying to clean the antenna rather than showing a pain response." Richard Chapman, from the University of Utah's pain research centre in Salt Lake City, stressed that most animals possessed receptors which responded to irritants. "Even a single-cell organism can detect a threatening chemical gradient and retreat from it," he said. "But this is not sensing pain."

Prof Elwood insists such arguments are flawed. "Using the same analogy, one could argue crabs do not have vision because they lack the visual centres of humans," he said. He urged further work looking at whether crustaceans have the neurological architecture to feel pain.

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Personalities evident in trout, Ontario researcher finds
DATE: 2007.11.26
BYLINE: Tom Spears
SOURCE: CanWest News Service

OTTAWA -- Fish have personalities.
Ordinary Canadian brook trout exhibit different traits: some are social, others not. Some are risk-takers, others scaredy-fish. And so on. University of Guelph scientists noticed the different personalities as they sat by the Credit River, west of Toronto, watching trout feed. Then they scooped out the fish and ran them through six days of personality tests in the lab, and even some swimming tests. And the revelation suggests an answer to an old question: How can different species, with different types of behaviour, evolve from a single starting point?

The idea of personalities is starting to spread across our views of the whole animal kingdom, says Rob McLaughlin, the Guelph biologist who ran the study. This seems obvious in the case of dogs or chimpanzees, but less obvious among fish. "We've known that out in the field, these young brook trout examine differences in their foraging behaviour -- what they're feeding on," he said.

In many lakes and rivers, there are two visibly different subgroups of the same fish species -- a slower and fatter version near shore and a sleeker, faster one out in open waters. But the Credit River brookies haven't reached that stage. They all looked the same, all living in a pool together, yet showing behaviour that differed. Some slower trout stayed near shore and hunted for tiny crustaceans while others rushed around in deeper water, picking insects off the surface.

McLaughlin and student Alex Wilson found that the personalities of the fish that went to the Guelph aquarium for tests stayed distinct even after the young fish, still just two to four centimetres long, left their natural homes. For instance, he put the fish in a dark tube in the aquarium. The more active fish were always the ones that emerged into the main body of the tank first. They were more ready to take risks, and less afraid of unfamiliar objects in the water. "What they do in the field predicts what they do in the lab," he said. "We were getting this sense that they perceive the environment differently, and the kind of things we measured are part of what people are starting to call personality traits in animals."

Most studies on species that subdivide focus on groups that have already split from each other, he said. "We were interested in, how does it get started in the

first place? There's this idea that you have these behaviourally flexible animals and they have an environment with different food types or habitats," and gradually they specialize to focus on one food type or habitat. The study was published in a science journal called Animal Behaviour. "The recognition that behavioural syndromes exist in a wide range of animal species is a key development in the understanding of animal behaviour," the journal says in an editorial. "The significance of these findings, and of other studies dealing with behavioural syndromes, is that we cannot assume that all animals in a population fit into precisely the same niche, or that they will all show the same degree of flexibility."

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Fish Have Distinct Personalities, Prof Discovers
November 22, 2007
University of Guelph
News Release

Fish have distinct personalities, which explains differences in behaviours like eating and swimming, according to new research by a University of Guelph professor. In a paper published in the journal Animal Behaviour, Prof. Rob McLaughlin of Guelph's Department of Integrative Biology and researcher Alex Wilson found that fish show extremes for personality traits: staying put or exploring, risk-averse or risk-takers, sociable or aggressive.

"We've seen the kinds of phenomena we associate with personality in humans showing up domesticated animals and now in wild animals," McLaughlin said, who teaches, among other things, animal behaviour. Personality differences can influence more complex behaviours; specifically, he examined the feeding strategies of very young brook trout. McLaughlin and Wilson observed two kinds of feeders among young brook trout in the Credit River near Toronto.

They noted that active feeders swam near the surface, away from the bank. Sit-and-wait feeders remained near the stream bottom, feeding on what passed by. "We wanted to test whether behavioural differences in the field were tied to underlying differences in personality," he said. So they caught the fish and tested them for six days in the Hagen Aqualab on campus. They found that fish that had been more active in the field spent more time moving in the aquarium, spent less time near the bottom and took less time to emerge from a glass jar than their sedentary counterparts.

Active fish stayed active and changed their activity less, on average, than fish that used a sit-and-wait strategy in the field. Subsequent work by current master's student Michelle Farwell has helped to cancel out potential differences caused by such factors as variations in resting metabolic rates or swimming ability. "What's cool is the possibility for individual behaviour to influence food

webs and interactions between prey and predators, and the evolution of fish populations with groups differing in behaviour and body form," McLaughlin said.

The researchers say their work may help in managing fish stocks more precisely by accounting for personality differences between groups of fish. Setting catch regulations based on studies of fish taken only from the water column, for instance, may cause relatively more active individuals to be caught than sedentary ones, with unexpected consequences for the entire population and for biodiversity. McLaughlin also suggests that, over many generations, these personality differences along with environmental differences may not only play a role in the creation of subgroups of fish but also the evolution of new species.

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GENERAL

Pain Education In Canada: Vets Get Over 3 Times More Training Than Other Health Sciences Grads, Including Doctors & Nurses
Press release
November 4, 2007

New study shows Veterinary Medicine grads get on average over 3 times more specific education time in pain than other Health Sciences students. Canadian graduates in Medicine, Dentistry, Nursing, Pharmacy and other healthcare professions lag badly behind Veterinary Medicine graduates in the amount of designated training hours they receive on pain, a new survey commissioned by the Canadian Pain Society has found.

Veterinary medicine students received an average of 98 hours of designated pain education, with specific teaching ranging between 27 to 200 hours. In contrast, medical schools for example identified an average of 16 hours, ranging from zero (where the respondent couldn't identify any specific training on the subject) to 38 hours, and nursing programs averaged 31 hours, ranging from zero to 109 hours.

“We have previously received considerable anecdotal information that most health sciences students receive poor and inconsistent training about the subject

of pain, leaving most healthcare practitioners poorly equipped to treat pain problems," said Dr. Barry Sessle, President of the Canadian Pain Society. "But this study provides clear-cut evidence of this and shows that overall, Health Science Faculties need to do much better to properly and consistently educate our graduates. Only then will they be equipped to meet the needs of Canadians, who quite reasonably expect our healthcare system to treat them at least as well as our four-legged friends." Dr. Sessle went on to say: "This poor level of education in pain just compounds the crisis of undertreated pain in Canada. Prior studies have shown us that acute pain is not well managed, and that 1 in 4 Canadians suffer from chronic pain, and yet access to effective treatment for chronic pain is poor, with many chronic pain patients in Canada having to wait years before they can be seen at a proper pain treatment program."

The survey collected data from 41 programs at 10 major universities across Canada, representing 7 of 8 provinces with medical schools, and an overall high (79%) response rate. Respondents from the universities provided breakdowns of any specific pain training by year, subject area, and whether it was mandatory or elective. "We noted with some concern that a full two-thirds of respondents were unable to specify any designated hours on pain, either in the course or clinical conferences," said Dr. Judy Watt-Watson, Professor at the University of Toronto's Lawrence S. Bloomberg Faculty of Nursing, and principal investigator for the study. "While 90% of health sciences and all veterinary programs professed to include 'formal' pain content in their curricula, the fact that this training wasn't quantifiable suggests that pain training may simply not be a priority in the great majority of the Health ScienceFaculties. This is supported by the fact that many respondents also expressed a need for pain-related curriculum resources."

Said Dr. Watt-Watson: "Overall, this study tells us that there is a dire need to address pain management in our health sciences curricula. We need to make a deliberate and concerted effort to ensure our future healthcare professionals are fully and consistently educated. Only then will they be able to meet the pain management needs of Canada's population." An executive summary and copy of the full report can be found at www.painexplained.ca. Painexplained.ca is a new campaign supported by the Canadian Pain Society, Canadian Pain Coalition, the Canadian Pain Foundation and other partner groups, companies and individuals. The campaign seeks to raise awareness and promote better prevention and management of all types of pain in Canada.

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Performance Traits Best Measure of Animal Welfare
Tuesday, December 04, 2007
The Pigsite

URBANA - It is time to recognise what farmers have known for generations - the highly productive animal will be the animal that appears to be experiencing low stress, says a University of Illinois Animal Sciences professor, Stan Curtis. In an article published in the Professional Animal Scientist (November 2007) he says that an animal state of being (ASB) has become a high priority for the public. "An important issue in animal agriculture nowadays is the public demand for evidence that animals on farms and ranches are being treated humanely," he explains. However, he also notes that as important as this question is, scientists have yet to reach consensus as to how to accomplish that task. "It is an unsettled area of knowledge that is seriously in need of more concerted attention," says Professor Curtis.

Impossibility
He says that it is not possible to objectively measure an animal's feelings in the laboratory, let alone in a production setting. And it is the interpretation of such observations of behavior patterns, which are putatively indicative of negative feelings. It is therefore difficult to understand where the practical usefulness of such subjective observations on farms and ranches. Others advocate more objectively measurable animal-performance traits as more valid indicators of ASB today

Curtis writes that what cannot be measured cannot be managed. "We can directly, objectively measure productive and reproductive performance, but not feelings, for example suffering; Performance reductions are early, sensitive indicators that ASB is being compromised," he adds. In the absence of an adequate scientifically informed understanding of its conscious feelings, the best single set of measurable, and so manageable, indicators of an animal's state of being will be its rates of productive and reproductive performance relative to its predicted potential to perform.

"The community of animal-welfare scientists should be enlarged to include more people who specialise in state-indicative animal traits, in addition to behavioural and cognitive ones," he says. Farmers have long recognised the effectiveness of performance as a measurement of ASB. They know that the highly productive animal will be the one that appears to be experiencing low stress and enjoying a high state of being. "If scientists would recognise this and more attention was accorded the performance axiom, then the recognition of performance as an indicator of ASB would have been resurrected from an unfortunate hiatus that has lasted for several decades," he pointed out.

Professor Curtis concludes that if progress is to be made in the assessment of ASB, then the importance and use of objective measures of animal performance must be markedly increased.

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Larger Livestock Ventilation Fans, Keeps Pace With Industry Trends
ThePigSite News Desk
October 23, 2007
URBANA - As animal housing continues to move toward larger buildings, the research team at the Bioenvironmental and Structural Systems (BESS) Lab at the University of Illinois is working hard to keep up with industry trends. What this means is that the BESS Lab, which is known worldwide for testing livestock ventilation fans, is checking out larger and larger fans.

"Companies bring their fans to the lab, along with one or two people to assist with the set-up. This helps keep costs low and industry participation high, which ultimately is good for the livestock producer." Steven Ford, a research engineer in the U of I Department of Agricultural and Biological Engineering and manager of the BESS Lab.

"For most new construction, the standard 'large' fan is no longer 48 inches, but rather 50 to 54 inches," said Steven Ford, a research engineer in the U of I Department of Agricultural and Biological Engineering and manager of the BESS Lab. "Airflow rates have increased proportionally, so fan airflow capacities are reaching the limit of our current test chamber." Therefore, Ford has taken the lead on garnering industry support to build a larger test chamber. "We have funds committed from ag ventilation companies in Canada, Michigan, Indiana, Illinois and Alabama," said Ford, "as well as in-kind equipment donations from companies in Illinois and Wisconsin."

The BESS Lab first opened in 1990 to provide unbiased engineering data to aid in the design, development and selection of efficient livestock ventilation fans. The lab tests ventilation fans sent to them by equipment manufacturers, or the manufacturers can rent the lab for a day, which Ford said is the most economical option. "Companies bring their fans to the lab, along with one or two people to assist with the set-up," he said. "This helps keep costs low and industry participation high, which ultimately is good for the livestock producer." Ford estimated that the lab has done more than 3,000 tests over the last 16 years. "We work with manufacturing companies around the country. We've tested fans from Europe and even Australia. We're fairly well known throughout the ag ventilation industry."

Listing option
Manufacturers have the option of listing their test data in "Agricultural Ventilation Fans: Performance and Efficiencies," a biennial publication that provides performance test results of over 800 commercially available fans. This information can be accessed at the BESS website at www.bess.uiuc.edu, or a hardcopy of the book can be purchased through the Midwest Plan Service at www.mwps.org or the National Food and Energy Council at www.nfec.org as well.

Ford pointed to the impact testing has had on ventilation fan performance over the years. "From 1991 to 2003, the average airflow performance of commercial livestock ventilation fans increased over 15 percent, and average electrical efficiency increased more than 20 percent," he noted. "Those numbers tell me that manufacturers will improve their product performance when there is an active performance test lab." Ultimately, said Ford, the goal is to help producers make more informed choices in ag ventilation systems. "The right fan will reduce odors, minimize the health risk of inhaling dust-laden air and optimize profits," he concluded. "Efficient ventilation systems are essential to producers."

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The most humane slaughter
Syed Ashraf Ali
[The New Nation]
Bangladesh
Dec 17/07

The great festival of Eid-ul Azha, popularly known in this subcontinent as Bakrid, is celebrated by the Muslims all over the world on the tenth of Dhul-Hijja every year through sacrifices and prayers in memory of the glorious sacrifice of the prophets Ibrahim Khalilullah and Ismail Zabihullah (peace be upon them). Millions of cattle are slaughtered on this auspicious day with a view to receiving the Divine Mercy through benevolence, Samaritanism, patience and constancy. This noble effort is, however, condemned by many an ignorant non-Muslim (including the immodest and sinful Brigitte Bardot), shrouded by total ignorance about the significance and sublime essence of Qurbani, as an act of wanton cruelty. What is more, the Islamic practice of slaughter or sacrifice by slitting the throat with a sharp knife has come under attack by some animal rights activists as being an inhuman form of cruelty to animals. It is claimed that the slaughtering of an animal with a knife is the most painful and tortuous method of killing. Nothing can be farther from the truth. It has been established beyond any shadow of doubt, through impartial scientific experiments conducted in non-Muslim countries, that the Islamic method of slaughtering with a knife is the least painful and thus the most humane method of killing an animal.

In most of the Western countries, it is required by law to stun the animals with a shot in the head before the slaughter. It is done with a view to rendering the animal unconscious and thereby preventing it from reviving before it is killed so as not to slow down the movement of the processing line. It is also used from a humanitarian point of view. It is presumed that this stunning prevents the animal from feeling pain before it dies. But research conducted in a non-Muslim country like Germany recently has come out with very surprising findings which nail to the counter the allegations against the Islamic method of slaughtering with a knife. The intensive research conducted at the School of Veterinary Medicine, Hanover University in Germany was headed by Professor Wilhelm Schulze. He was

assisted by Dr. Hazim. The study was named: "Attempts to objectify pain and consciousness in conventional (captive bolt pistol stunning) and ritual (Islamic method of cutting with knife) methods of slaughtering sheep and calves." The results were most unexpected to the non-Muslim Westerners. The claim that the CBPS (Capital Bolt Pistol Stunning) method was least painful and most humane was dashed to the ground. The findings testified to the fact that the slaughter of an animal with a sharp knife is the least painful and most humane of all methods of killing.

In the study several electrodes were surgically implanted at various points of the skulls of all animals under experiment, touching the surface of the brain. The animals were allowed to recover for serveral weeks. Some animals were then slaughtered, according to the Islamic method, by making a swift, deep incision with a sharp knife on the neck cutting the jugular vein and the carotid arteries as well as the trachea and esophagus. Other animals were stunned with the aid of a 'Captive Bolt Pistol' (CBP). During the experiment an electroencephalograph (EEG) and an electrocardiogram (ECG) recorded the condition of the brains and the hearts of all the animals during the course of slaughter and stunning.

The results were as follows:
Slaughtering with a knife (The Islamic Method)

1. The first 3 seconds from the time of the slaughter (in the Islamic Method) as recorded on the EEG did not show any change from the graph before slaughter, thus indicating that the animal did not feel any recognisable pain during or after the incision.

2. During the following 3 second, the EEG recorded a condition of deep sleep-unconsciousness. This is due to the large quantity of blood gushing out of the body. The sudden and profuse bleeding from the incision on the neck causes a shock resulting in a state of unconsciousness due to severe shortage of blood supply to the vital centers located in the brain.

3. After the above-mentioned 6 seconds, the EEG recorded zero level, showing no feeling of pain at all.

4. As the brain message (EEG) dropped to zero level, the heart was still pounding and the body convulsing vigorously (a reflex action of the spinal cord) driving out a maximum amount of blood from the body, thus resulting in hygienic meat for the consumers.

Captive Bolt Pistol (CBP) Stunning Method
1. The animals were apparently unconscious soon after stunning.
2. But EEG showed severe pain immediately after stunning.

3. The hearts of animals stunned by CBP stopped beating earlier as compared to those of the animals slaughtered according to the Islamic method, resulting in the retention of more blood in the meat. This in turn is unhygienic for the consumer.

CBP Method and mad cow disease (MCD)
The Western method of stunning animals with a shot in the head is not only severely painful, as shown by the above experiment, but it is also alarmingly unhygienic. There is rising concern (Based on the findings of some researches) that the method may be a factor in the spread of Mad Cow disease (MCD) from cattle to human beings. Two independent researches carried out recently at the Texas A & M University and by Canada's Food Inspection Agency discovered that a method called Pneumatic Stunning (in which a metal bolt is fired into the cow's brain and followed by a pulverising burst of 150 pounds of air pressure) delivered a force so explosive that it scattered brain tissue throughout the animal's body. The findings are really disturbing since brain tissue and spinal cord are the most infectious parts of an animal with Mad Cow Disease which causes Swiss cheese like holes in the brain of the infected animal. It is all the more alarming because 30 to 40 per cent of the American cattle are stunned by pneumatic guns before the slaughter.

As for the most modern method of electric stunning being practiced in many developed countries, the Meat Inspection Branch of the United States Department of Agriculture came to the following conclusion in 1953: "The use of electric stunning methods by plants which operate under federal meat inspection has not been permitted as a result of experiments which were conducted several years ago at the University of Chicago. These experiments indicated that electric stunning in hogs resulted in certain changes in the tissues which could not be differentiated by gross examination from similar changes produced by disease."

In 1955 the Danish Ministry of Justice issued a circular which said, "Stunning with electricity causes extravasation in meat, sanguinary intestines and fracture in the spinal column, pelvis and the shoulder blades through shock. The blood in the meat makes it more susceptible to putrefaction and has a detrimental effect upon its taste. The properties of the meat which would co-operate with the salt in extracting the blood traces are interfered within the animal undergoing shock convulsions prior to slaughter."

In 1954 British regulations were amended and electric stunning was prohibited, "the reason being that stunning seriously affected the quality of British bacon." It was also observed: "Electric stunning hastens the onset of putrefaction in meat. The explanation of the phenomenon lies in the high lactic acid level following electric shocks prior to bleeding. High lactic acid alters the bacterials resistance of meat."

If the head of the animal is severed by one sharp blow through guillotining or Bali at the sacrificial post, there will be sudden contraction of voluntary muscles which

will expel important nutrient fluids and, as in electric shock, some lactic acid will also form. What is more, since the heart will stop suddenly, there will not be sufficient bleeding which is needed for better and healthier meat.

It is evident from the above-mentioned studies that the Islamic slaughter of animals is a blessing to both the animal and the person who consumes it. It may, however, be mentioned in this connection that the Islamic method insists on several measures to make the slaughter lawful. This is done to ensure maximum benefit to both the animal and the consumer.

The Islamic method indeed demands that the knife to be used for slaughtering animals must be sharp and used swiftly. The swift cut of vessels of the neck disconnects the flow of blood to the nerves in the brain responsible for pain. Thus the slaughtered animal feels no pain. It may be mentioned in this connection that the movements and withering of the different limbs of the animal after the incision is made are not due to pain, but due to the contraction and relaxation of the muscles deficient in blood. The convulsions are due to the contraction of the muscles in response to the lack of oxygen in the brain cells. The muscles, by these contractions, squeeze out blood from the blood vessels in the tissues to pour it into the central circulation system to be sent to the brain, but this is lost on the way (due to cutting of big vessels in the neck) and the brain cells consequently keep on sending messages to the muscles to wring out blood, until the animal dies, Convulsions thus occur when the animal becomes unconscious. And because the slaughtered animal becomes unconscious for massive haemorrhage, it does not feel pain while bleeding.

Lastly, the Islamic method also insists that the cut should involve the windpipe (trachea), gullet (esophagus), and the two jugular veins without cutting the spinal cord. This method results in rapid gush of blood draining most of it from the animal's body. If the spinal cord is cut, the nerve fibres to the heart might be damaged leading to cardiac arrest, thus resulting in stagnation of blood in the blood vessels. The blood must be drained completely before the head is removed from the body. As most of the blood, which acts as medium of microorganisms, is removed the meat becomes purified and also remains fresh for a longer period as compared to the meat obtained through other methods of slaughtering like gullotining or decapitation, CBPS and electric stunning.

The Islamic method of slaughter is, therefore, not only the most humane and least painful but also the most hygienic of all the methods of killing animals

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EUROPEAN agency: Cloned animals 'unlikely' to pose risks
11.jan.08
Washington Post
Rick Weiss

The European Food Safety Authority was cited as saying this morning said it has concluded that meat and milk from healthy cloned cattle and pigs is "very unlikely" to pose risks to consumers, opening the door to possible European sales of those controversial foods in the future. The story says that the highly anticipated draft scientific opinion of the European agency comes just days before the U.S. Food and Drug Administration is due to release its final report on the same topic, which is expected to come to virtually the same conclusion. Some backers of the fledgling agricultural cloning industry have said they hoped that a positive report from Europe might ease the process of gaining acceptance by American consumers.

It remains unclear, however, whether the European Union will ultimately approve the sale of cloned products, and if so under what conditions. Unlike the case in the United States, such decisions in Europe are required by law to incorporate social and ethical considerations. And the European public broadly supports the so-called precautionary principle, which calls for society to err on the side of caution when risks are uncertain. Moreover, the European agency, which provides scientific advice to the European Commission, notes in its report that many cloned farm animals have health problems, including life-threatening physiological abnormalities. In Europe, where animal welfare is a much higher profile issue than it is in the United States, that reality could also become a stumbling block.

The 47-page report concludes, however, that cloned animals with health problems would be screened out by traditional food inspection methods. And echoing earlier assertions by the FDA, it finds that milk and meat from healthy clones are as nutritious and safe to eat as milk and meat from ordinary animals. "Based on current knowledge there is no expectation that clones or their progeny would introduce any new food safety risks compared with conventionally bred animals," the report says.

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The next best thing to knowing something is to know where to find it.