



IMPROVING RELIGIOUS SLAUGHTER PRACTICES IN THE U.S.

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ABSTRACT

This paper, based on thirty years of experience in developing equipment for handling cattle, explores the technical aspects of animal slaughtering in Northern America, particularly halal and kosher slaughter practices. It gives first hand description of the different methods which are in use, always in relation to animal welfare concerns. The author then draws concrete conclusions regarding means of ensuring an improved treatment for all types of animals to be slaughtered.

KEYWORDS

Slaughterhouses, religious slaughter, animal welfare, kosher, halal.

RESUME

Cet article, fondé sur trente années d'expérience dans les abattoirs, explore les aspects techniques de l'abattage des animaux de boucherie en Amérique du Nord, tout particulièrement l'abattage religieux, kasher et halal. La description minutieuse des différentes méthodes utilisées vise à éclairer les éléments posant problème et faisant atteinte au « bien-être » des animaux. L'auteur propose ensuite des mesures permettant d'améliorer le traitement des différentes espèces d'animaux et d'alléger les souffrances au moment de l'abattage.

MOTS CLES

Abattoir, abattage rituel, bien-être animal, kasher, halal.



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For thirty years I have worked in the meat industry designing and installing equipment for handling cattle. Half the cattle in the U.S. and Canada are handled in a center track conveyor restrainer system that I designed (Grandin, 2003). My job is to work in the plants developing and implementing more humane methods for handling the animals. During my career I have worked in over 50 plants installing equipment and I have visited over 200 plants around the world. Further information on systems I have designed is in (Grandin 2000, and 1990).

In the United States, the handling of animals to prepare them for kosher or halal slaughter is exempt from the Humane Slaughter Act. Stunning is legally required for conventional slaughter and hoisting of sensible animals prior to stunning is not permitted. All mammals undergoing conventional slaughter have to be stunned and rendered insensible while they are either standing in a stunning box or held in a comfortable upright position in a restraint device. However, stunning is not legally required for religious slaughter. Some plants restrain fully sensible cattle, calves or sheep by hanging them upside down by a chain attached to their ankle. This is a stressful, cruel method of restraint that should be eliminated, but it is legal in the U.S. for religious slaughter.

Many large meat buyers, such as supermarkets, restaurants, and food service companies require their suppliers to adhere to the AMI guidelines. This voluntary guideline published by the American Meat Institute (meat trade organization) recommends that animals be held in a comfortable upright position during slaughter. Shackling and hoisting, dragging, leg clamping, and trip floor boxes should never be used (Grandin, 2005).

Plants that shackle and hoist sensible animals are removed from the approved supplier list of large buyers who audit plants. All large U.S. meat buyers allow religious slaughter without stunning due to concerns about freedom of religion.

Conditions in the U.S. in 2005

Most of the large plants that perform kosher slaughter of cattle have eliminated shackling and hoisting of fully sensible cattle and have replaced it with a restrainer that holds the animal in an upright position. All the U.S. religious slaughter plants that are owned by large corporations who own multiple plants have eliminated cruel shackling and hoisting. They did this due to concerns about employee safety, requirements of major meat buying customers, and pressure from animal activists.

In the U.S. cruel methods of restraint are still used in some small independently owned plants that perform religious slaughter. They continue to do this because it is cheap and their customers are not demanding that they stop shackling and hoisting. Due to the fact that the law has a religious exemption, the most effective way to get these plants to change is to get their customers to demand change. Some customers who buy kosher or halal meat are very



concerned about animal treatment and others have little concern as long as the meat obeys the letter of religious law.

Description of the Worst and Best Restraining Methods

There are two main welfare issues when slaughter without stunning is performed. They are the animal's reaction to the restraint method and the animal's reaction to the throat cut. When a stressful restraint method is used, it is impossible to observe the animal's reaction to the throat cut. Struggling caused by stressful restraint masks reactions to the throat cut.

Fifteen years ago when I observed shackling and hoisting of large 500 kg (1200 lb.) cattle I was horrified. The animals were shocked multiple times with an electric goad to force them to leap into a box that had a slick floor mounted on a 30 degree angle. This trip floor caused the animal to fall down. A chain was wrapped around the steer's back leg and he was dragged out and hoisted up. The whole time the terrified animal was bellowing and struggling. Bellows from the beasts could be heard everywhere in the plant. After the struggling steer was fully suspended a nose tong connected to a powerful air cylinder was placed in the animal's nose. The cylinder pulled on the nose tong to stretch the animal's neck. This is the most barbaric thing I had ever observed. It had to be changed. In a civilized society this horrific practice had to be stopped. There were five huge steers hung up in a row and they were all bellowing and thrashing.

My job was to rip out this nightmare and replace it with a gentle low stress way to hold the cattle. At the time, upright restraining boxes existed for kosher slaughter, but many of these units had poor pressure controls and excessive pressure was applied to the animal. In another plant I observed that many cattle bellowed when they were squeezed too hard in one of these boxes.

I went to an equipment company and redesigned the upright box so that the amount of pressure applied to the animal could be controlled. The mechanisms were also designed to eliminate sudden jerky motion that frightens cattle. More details on the engineering and design are in (Grandin 1994, 1992, Grandin and Regenstein 1994). During the startup of the new restraint box I had the opportunity to operate the box myself. It worked so well that I could not believe it. I wrote this description in *Meat and Poultry Magazine* (Grandin, 1991a).

As each steer entered the kosher restraining box, I manipulated the controls to gently position the animal. After some practice, I learned that the animals would stand quietly and not resist being restrained if I eased the chin-lift up under the animal's chin. Jerking the controls or causing the apparatus to make sudden movements made the cattle jump. A good operator learns how to make the device an extension of their hands. The more gently I operated the restraining box, the less pressure was required to control animal movement. Some cattle were held so loosely by the head-holder and the rear pusher gate that they could easily have pulled away from the rabbi's knife. I was relieved and surprised to discover that



the animals don't even feel the super-sharp place as it touches their skin. They made no attempt to pull away. I felt peaceful and calm.

Does the Throat Cut Hurt?

In other plants with upright restraining devices, I made further observations to determine if slaughter without stunning causes pain. If the cattle stay completely calm while kosher slaughter is performed, they flinch slightly at the beginning of the cut. There is no other movement until convulsions start when sensibility is lost. Immediately after the cut I loosened the head holder and body restraints. Most cattle looked around for 5 to 60 seconds until they collapsed. They did not seem aware that their throats were cut. Waving my hand in front of the animal's face caused a much bigger reaction than the kosher cut (Grandin, 1994).

When I first observed this, I was really surprised. With bulls I did further experiments. The head holder was applied with very little pressure. If I waved my hand in a bull's face he was able to move the head holder. When the rabbi did the cut, he did not move.

The long knife used in kosher slaughter is essential. Observations of halal slaughter of cattle with short knives indicated that digging the end of the knife blade into the throat caused intense struggling. For kosher slaughter there are strict religious specifications on the length of the knife. For halal slaughter there are no knife length specifications. The knife must be long enough so that the end of the knife remains outside the neck. It is also essential that the wound is held open during the cut. If the wound closes over the knife during the cut, the animal will struggle. Struggling is definitely an indicator of pain.

There are five rules that the Jews have for a correct cut. I have observed that if the rules are disobeyed the animal will struggle. If these rules are obeyed the animal has little reaction. The five rules are (Cohen, 1949; Epstein, 1948):

'Shechitah' (Delay) – A delay or hesitation of even a moment makes the animal's flesh unkosher. The knife must move in a single uninterrupted sweep.

'Derash' (Pressing) – The knife must be drawn across the throat with little exertion. Any undue pressure renders the animal unkosher.

'Haladah' (Digging) – The knife must be drawn over the throat so that it is visible while shechitah is being performed.

'Hagramah' (Slipping) – The limits within which the knife may be inserted are from the large ring in the windpipe to the top of the upper lobe of the lung when it is inflated, and corresponding to the length of the pharynx. Slaughtering above or below these limits renders the meat unkosher.

'Ikkur' (Tearing) – If either the esophagus or the trachea is torn out or removed from its normal position during slaughter the carcass is unkosher.

The shochet also has to check the blade after each animal to make sure it has no nicks. A nick will cause pain.



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What has happened in many plants that conduct religious slaughter is that they obey the letter of the law concerning how the act is done but they ignore how the animal is restrained. It is a blindness to animal suffering and the original intent of religious slaughter is lost. The original purpose was to reduce suffering and pain.

Insensibility is Not Instantaneous

Scientific research clearly shows that insensibility is not instantaneous (Daly et al., 1988, and Blackmore, 1984). The time to lose sensibility can vary. Sheep lose sensibility more quickly than cattle (Levinger, 1979). The time to lose sensibility can vary from 4 seconds up to over 60 seconds (Blackmore, 1984). I have observed that the skill of the shochet has a big effect on how quickly animals become insensible. A really good shochet can make 90 to 95% of the cattle collapse within 10 seconds. A poor shochet can have many cattle that remain sensible for over a minute. This can occur even though both carotid arteries and jugular veins are cut. The most effective cuts that cause the animal to collapse quickly are made with a fast swift stroke as close to the jaw as religious law will allow. A slow stroke is more likely to cause delayed onset of insensibility. This is likely to be due to sealing off of the severed ends of the carotid arteries. The angle of the cut may also have an effect on the onset of insensibility.

Another principle is that calm cattle lose sensibility faster than excited cattle. Quiet handling and low stress restraint will help produce rapid onset of insensibility. Animals should not be held in the fully restrained positions for more than 10 seconds. Immediately after the throat cut, the head restrainer and body restraint should be loosened.

Auditing Religious Slaughter

Audits based on objective numerical scoring of stunning, insensibility, vocalization, electric goad use and slipping and falling have been effectively used in many countries to improve animal welfare. In these audits, the slaughter plan is evaluated on objective measurements (Grandin, 1998a, 2005b).

There is a need to audit plants that conduct religious slaughters. In the U.S., the two largest kosher plants are audited by restaurants and supermarkets. These plants are very good compared to unaudited plants. The smaller plants are mostly outside of the restaurant and supermarket audit system. Practices in some of the plants were atrocious. In 2004, PETA, an animal rights group, videotaped a steer walking around with its tracheas (windpipe) ripped out, after it had been kosher slaughtered. Ripping out the trachea is not a normal part of kosher slaughter. Veal calves, sheep, and goats are still being shackled and hoisted in many small plants in the USA.



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The measurements that would be used in religious slaughter would be:

- Percentage of animals rendered insensible within 10 to 15 seconds.
- Percentage that vocalize (moo or bellow) during handling and restraint.
- Percentage that are moved with an electric goad.
- Percentage that slip during handling.
- Percentage that fall during handling.

The audit is failed if any dressing procedures such as horn removal or skinning is done on an animal showing any signs of sensibility.

The use of numerical scoring enables a plant to work on continuous improvement of these procedures. By keeping score they can determine if performance is improving or becoming worse. Each variable is scored with a simple yes/no scoring system. An animal is either moved with an electric goad or not moved with one. It is either silent or it is a vocalizer. The numerical scoring system is outcome based. Instead of having specifications on how to make flooring, the floor is evaluated by determining how many animals slip or fall.

For cattle and calves in both upright and rotating boxes, 95% of the animals must be silent and not vocalize (moo or bellow) during entry into the holding device and the entire time they are in the device prior to the throat cut. Vocalization is an indicator of stress in cattle during restraint (Dunn, 1990). Vocalization scoring does not work for sheep. When sheep are injured they do not vocalize (baa baa). Cattle vocalize in response to an aversive event such as electric prods, excessive pressure from a restraint device, pinching or slipping, and falling (Grandin, 1998b). For both cattle and sheep, 99% of the animals must be able to be handled with no falling down. Seventy-five percent of the cattle and calves must be able to be moved into the restraint device with no electric prod. For sheep the use of electric prods is not recommended.

Features of Upright Restraint Devices to Reduce Stress

All restraint devices for both conventional and religious slaughter should have the following features to reduce stress. These principles apply to all types of restraint devices.

Non-slip flooring in the lead up race and in the restraint device. Animals panic when they start slipping. Slick, smooth floors are one of the most common problems that need correcting.

Pressure limiting devices on all parts of the device that press against any part of the animal. Excessive pressure can cause struggling in both species and vocalization (mooring or bellowing) in cattle or calves. If the bovine vocalizes in direct response to application of either head or body, restraint is either too tight or it is being pinched by a sharp edge.

If the restrainer is powered by hydraulics the pressure relief valves must be set so that cattle or calves do not vocalize when the control levers are held down and the pressure relief valve allows the fluid to bypass back to the reservoir. On



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hydraulic and pneumatic powered restrainers, the head holder, body restraint and rear pusher gate will need to be on separate circuits that are set at a lighter maximum pressure than other parts such as heavy entrance and exit gates. Depending on the design, some hydraulic systems will need to have three separate circuits to prevent excessive pressure from being applied to the animal. On pneumatic powdered systems, pressure can be limited by using small diameter cylinders. A well designed restrainer must not be totally dependent on operator skill to limit the maximum pressure that can be applied to an animal.

Use the concept of optimum pressure. A restraint device must hold an animal tight enough to make it feel held, but not so tight that it causes struggling or vocalization. A common mistake is to apply too much pressure.

Moving parts of a restraint device should move with a steady motion. Sudden jerky motion scares the animals. On hydraulic and pneumatic powered equipment, adjustable flow controls should be installed to control the speed that different parts of the restraint device move. Control valves should have good throttling ability so that the operator has control over the speed of movement (Grandin, 1992).

Remove distractions that cause animals to balk and refuse to move into the restrainer. Animals are afraid of seeing people up ahead, air drafts blowing towards them, dark places, and reflections. More information is in Grandin (1991b, 1996, 2000; Giger et al., 1977; Westervelt et al., 1976). Simple changes such as adding a light, moving a lamp, and installing shields to block the animal's vision are often all that is needed.

Table 1. Guide to improving animal movement into restraint (fixation) devices.

Distractions that cause an animal to balk and refuse to move	Method to improve animal movement
Shining reflections on wet floors or metal	Move lamps to eliminate the reflection
Restrainer entrance is too dark	Add overhead indirect lighting
Jiggling metal or hanging chain	Remove it
See people or moving machinery through the restrainer	Install a solid shield to block vision
Air hissing	Install silencers
Metal banging noise	Install rubber strips



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Table 2. Welfare Ranking of Restraint Devices

Ranking	Restraint Device
Excellent	Animal held in an upright position. Research with sheep indicates that animals prefer being held in an upright position. Rushen (1986) reported that when sheep were forced to make repeated choices between upright or inverted restraint, they favored upright restrainer.
Welfare concerns	Rotating restraint box that inverts the animal onto its back. It must have a large adjustable side to support the body and prevent struggling or vocalization during rotation. This class of rotating restrainers would include the Facomia pen and other similar devices. An animal must have its throat cut within 10 seconds after inversion. Rotating boxes are for religious slaughter only. Aspiration of blood is a welfare concern when the animal is held on its back.
Not Acceptable	Rotating box with no adjustable side to provide body support. This would include the old fashioned Weinberg casting pen. Dunn (1990) found that cattle held on their backs in the old fashioned Weinberg for 90-103 seconds had significantly higher cortisol and vocalization rates compared to cattle held in an upright restrainer.
Serious Problem Automatic FAILED AUDIT	The following methods of restraint should never be used for conscious animals that are still sensible. Shackle and hoist and suspension by the leg or legs. Shackle and drag by the legs and then roll the animal onto its back. Trip floor boxes that cause the animal to fall down with the use of a slanted floor or other device. Leg clamping rotating boxes.

Conclusions

If the religious authority will accept stunning, stunning will usually improve animal welfare. To conduct slaughter without stunning with an adequate level of welfare requires more skill and attention to the details of the procedure compared to slaughter with stunning. To get the good results I described in the paper requires both skilled people and well engineered equipment. It would also require auditing on a weekly basis with numerical scoring to prevent practices from being sloppy. People manage the things they measure.



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In the U.S., the most effective way to get smaller plants to stop shackling and hoisting prior to ritual slaughter is to educate the meat buyers so that they will insist on the use of low stress restraint devices.

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