

**Expert Opinion on Considerations When Evaluating All Types of Slaughter:
Mechanical, Electrical, Gas and Religious Slaughter**

And

**A Critical Scientific Review of
Report 161: Ritual Slaughter and Animal Welfare (September, 2008);
Report 398: Report on Restraining and Neck Cutting or Stunning
and Neck Cutting in Pink Veal Calves (September, 2010)
by the Animal Sciences Group, Wageningen UR;
and the 2009 New Zealand Papers by Gibson *et al.***

Preliminary Report

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Notice: Because of the short time line for preparing this paper, the references are not complete. The report has been shared with Dr. Temple Grandin and her comments are awaited. DialRel Deliverable 1.3 will be analyzed in the future. The visit to the Dutch slaughterhouse that does both kosher and halal slaughter will be reported on in a supplement to this report.

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Opening Statement

This paper is meant to address some of the critical issues that are being raised in The Netherlands with respect to “religious” slaughter. The term religious slaughter has been chosen because that is what it is – it is the way people of the Jewish and Muslim faiths carry out slaughter in keeping with the requirements of their religious texts. There is an effort in the Netherlands to ban un-stunned slaughter which would make all kosher slaughter impossible and would make slaughter for most Muslims also impossible.

It is impossible to compare different slaughter systems – they all have their pluses and minuses. The key for us as scientists is to optimize each of them and recognize that science has some limitations. For example, the four alternative methods for stunning animals (penetrating captive bolt, non-penetrating captive bolt, electrical stunning (using many different voltage/amperage relationships) and gas stunning (with various gases) cannot possibly all be equally good for animals. Yet, all four are used in some cases for the same species of animal. So how does one determine the right one and why are the others then not banned? (Note: This is not advocating the banning of three of the four methods, i.e., but it is asking the question of deciding which is best, under which circumstances or management options – because it is unlikely that all four provide equal animal welfare. However, when properly optimized and used appropriately, each leads to a satisfactory outcome. And it is safe to strongly argue that religious slaughter is well within the same “range” of satisfactory outcome as these other four methods, each of which must be used properly or welfare may be compromised in excess of the concerns expressed for religious slaughter.)

Efforts to prove scientifically that religious slaughter is inhumane [i.e., to establish a broader principle] is beyond the scope of science. The degree of humane treatment is a bioethical issue of what “ought” to be. If scientific standards are used to define pain/suffering then that standard must be used to evaluate all competing methods of management/slaughter when used properly and improperly. The issue of what is and is not humane needs to be a part of a broader discussion of what is the current standard of humane that includes hunting, bull-fighting, cock-fighting, dog racing, horse racing, and other uses by humans of animals. The real goal of both the religious and scientific community ought to be to optimize animal welfare in the context of producing food fit for consumers and to address the issue across a wide spectrum of issues.

Dr. Temple Grandin from Colorado State University, a globally recognized expert on animal handling and slaughter has identified two truly excellent religious slaughter plants (both in Canada) (Grandin, personal communications) and so far no research has been done in these facilities other than Dr. Grandin’s observational work. The immediate goal should be to make every religious slaughter plant as good as or better than the conditions found in those two plants with constant improvement over time. Research needs to be done in these two plants to establish the current measureable criteria for evaluation of an “excellent” facility. And those facilities might also be improved further. It is important to remember that many of the regular slaughter plants also need to be improved to reach the stage of being “excellent”. Dr. Grandin’s recent statement supporting religious slaughter done right is found in Appendix I.

If animal welfare improvement is truly the goal, then the Dutch Parliament should be simultaneously considering rules to improve regular slaughter (e.g., require all plants to meet a widely accepted standard such as the American Meat Institute Standards for Slaughter written by Dr. Temple Grandin and accepted by all of the high end groups offering humane animal certification programs such as Farm Forward and Certified Humane) and to improve the training of those who hunt.

1. Science, government regulation and improving slaughter practices:

Dr. Temple Grandin is the world's leading expert on slaughter practices and animal welfare with respect to slaughter practices. Her efforts in the United States have dramatically raised the bar for the humane treatment of animals prior to and at the time of slaughter.

Any evaluation of religious slaughter requires an understanding of the complex interaction of the animals' prior condition, the physical system used both for slaughter and to get the animal to the point of slaughter, the commitment of management to good animal welfare, and the actual training and monitoring of the activities of those involved in bringing the animals to slaughter and in doing the actual slaughter. The actual details of slaughter are the most important aspects covered by very specific religious rulings. Thus, it is possible to make a lot of changes and improvements in the quality of religious slaughter without impinging on the religious rules. Like regular slaughter, the emphasis needs to be on working with the religious communities and the slaughter facilities to improve religious slaughter (and regular slaughter also).

In general it is important to recognize that religious slaughter takes more effort to do right, but that when done right it may in fact be better than other forms of commercial slaughter. Thus, the goal is to work together to make it right. Because it is a more labor-intensive and a slower process, it does not appear possible to require that all animals be slaughtered using religious slaughter done right rather than using the current less humane non-religious slaughter procedures, which from the animal's point of view might in fact prove to be unfortunate.

If one looks at the academic literature on the scientific research related to religious slaughter, it is clear that much of the literature fails to provide sufficient information to determine how the religious slaughter was done in sufficient detail to evaluate whether the data collected at a particular slaughterhouse can in any way be generalized. Nor is it possible to repeat the experiment with the information in the methods and materials section as provided. These attempts to generalize also often do not take into account species differences. Sheep, cattle, chickens and turkeys each have unique issues. The goal of the research seems to be to question religious slaughter generally even if the data comes from bad operations, rather than to determine what is not working and figure out how to improve it. These results certainly could and should be used **to** show the management of that plant that there is room for improvement. A set of good practices for religious slaughter under different circumstances would be extremely helpful in helping these plants improve their practices.

Thus, beyond any scientific criticisms of any specific research paper, the question of whether any of the literature in this area can actually be generalized beyond the one or few systems evaluated by a particular research is essentially impossible. By analogy: if a researcher took data from

electrical stunning at a particular voltage and current and generalized that data to cover all usable voltages and currents those conclusions would be rejected by the peer review process. If those studies were then used to generalize the impact of mechanical stunning and gas stunning, it would be ridiculed. However, that is exactly what has happened with many of the religious slaughter studies. In many cases one cannot even determine the details of which animal handling system was used.

Dr. Grandin's statement on religious slaughter: "Recently, I participated in a ritual kosher slaughter -- in this ritual, the way it was meant to be done, I must say. This was at a plant where the management really understood the importance and significance of what they were doing, and communicated this to their employees -- and to the animals as well, I believe. 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... 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 blade as it touches their skin. They made no attempt to pull away.*** I felt peaceful and calm" (Regenstein and Grandin 1992). This should be the goal – so that all slaughter, both religious and non-religious, meets this high standard.

That the focus of the research community on the details of what takes place at the time of slaughter as the sole focal point for much of the research is badly misplaced. The work of Dr. Temple Grandin in the US and around the world (e.g., Grandin and Regenstein, 1994 for a summary of some of this work) and others who she helped train show that a great deal of improvement is possible by working positively with everyone to do religious slaughter better. By working with the industry, she has been able to improve all forms of slaughter, including religious slaughter. The fact that so much of the other research seems to be focused on trying to take the worst systems for preparing animals for religious slaughter and showing that they are not working properly, which they may well be. Erroneously presenting them as the norm is a misuse to drive an agenda that clearly is more interested in maligning religious slaughter than working for the benefit of improving animal welfare (see Appendix II). Working with the religious community to develop better systems of managing religious slaughter is both respectful of the religious community and their rights and is more likely to lead to real improvements in animal welfare, which should be everyone's goal.

2. The Importance of Religious Slaughter

Obtaining meat by means of procedures that comply with essential religious tenants is an integral part of being an observant Jew or Muslim for many practitioners of these religions. Although some Jews and Muslims may opt for a vegetarian diet, and some are observant of food laws to varying degrees, major religious events often center on a meal involving meat. *The loss of the right to slaughter meat is viewed as a direct attack on the religion – as highlighted by Nazi Germany's first restrictions on Jews being the prohibition of religious slaughter.*

This contrasts sharply with the situation in the United States, where the US Congress in 1958, after investigating the matter, including the science available at that time, declared that *religious slaughter was one of the ways to undertake humane slaughter*. The specific law is Public Law 85-765 and it says as follows: “Either of the following two methods of slaughter and handling are hereby found to be humane.... (b) By slaughtering in accordance with the ritual requirements of the Jewish faith or any other religious faith that prescribes a method of slaughter whereby the animal suffers loss of consciousness by anemia of the brain caused by the simultaneous and instantaneous severance of the carotid arteries with a sharp instrument.”

The Muslim community is divided on the issue of pre-slaughter stunning. Survey research suggests that most Muslims actually want un-stunned slaughter although the industry has moved to providing a lot of halal meat using electrical stunning. This is leading to a serious disconnect between the Muslim community and the meat industry. The Jewish community is united in opposing pre-slaughter stunning. An attempt by Marianne Thieme of the Animal Welfare Party to state otherwise totally misrepresented the opinions of a non-Orthodox group. A statement by that group rejecting her statement is found in Appendix III and will be discussed further in the extended text below.

The post slaughter stunning of cattle is routinely used in some US slaughterhouses. This is simply not accepted by the normative mainstream American Orthodox Jewish community. This appears to remain the case in both Europe and North America. Thus, as a practical matter the use of post-slaughter stunning remains as an unacceptable procedure for the Dutch Jewish community.

The European Union’s Parliament currently is debating whether meat using un-stunned slaughter needs to be labeled, possibly with a specific reference to the religion of the person doing the slaughter. Unless all meat is labeled as to how it was slaughtered, this is clearly an attempt to make this meat undesirable in the broader marketplace and is selectively targeting the Muslim and Jewish Community. A few years ago the Farm Animal Welfare Council, a non-departmental public body in the United Kingdom came out with an unfavorable report on religious slaughter without any updating of the literature, which it claimed to have reviewed in 1985. And much of the older (and newer) data is faulty as will be established in this report and does not meet the minimum standards required of scientific work. The DialRel project of the EU (Dialogue on Religious Slaughter) was more of a monologue and made no effort to understand the actual practices of the religious communities and what was directly related to slaughter and what were peripherals reflecting other aspects of the slaughter that are not subject to religious requirements. In the future, a detailed review of their publications is needed to document a number of fallacies in their report. Limited time has precluded this from occurring at this time.

The recent YouTube videos by the Dutch Animal Party’s Scientific Bureau, the Nicolaas G. Pierson Foundation (<http://www.zocial.tv/today/Nonprofit/5711429/religious-slaughter-without-stunning> and <http://www.youtube.com/watch?v=CczdgdwHAzOg>), continue this on-going record in Europe of presenting misleading information. The video shows some really bad religious slaughter (although it is questionable if this was religious slaughter since some important rules related to halal religious requirements seemed to have been violated along with the very poor animal handling) and this is actually recognized as such by some of the commentators in the

video. They show one clip (twice) of an animal being properly stunned without dealing with the fact that stunning can often go bad, which is ignored. The bad handling is just that, bad handling and is unacceptable. It needs to be dealt with but in fact the video does not deal with the actual issue of the humaneness of the religious slaughter act.

By way of critical background (information with some editorial content): The preparation of animals for religious slaughter can be done in many different ways and uses many different pieces of equipment. Some of the major ways are “shackling and hoisting and its variants (considered unacceptable by both Dr. Grandin and this author for cattle), upside down slaughter using a rotating pen (which can be done successfully but is difficult to do well), and upright slaughter (which is the best way to do slaughter and can be done either with a static system or some type of moving system that brings animals to the point of slaughter.) A review of the system used in Holland following a visit to the one kosher slaughter plant, which also does halal slaughter, will be reported on as a supplement to this report.

The Special Issue of the Prejudicial Labeling of meat

It is understandable that the government has an interest in assuring that all meat is slaughtered using basically humane procedures. It is not so clear that the government has any interest in labeling how the meat was slaughtered. Consumers of kosher and halal meats pay a premium for those certifying labels, because they care. Not all kosher observant or halal observant consumers will accept all the labels available to them. Most consumers do not care about the manner in which the animal is slaughtered as long as it is humane.

Labeling meat that is not marketed to the religious communities and is not presented to consumers as meeting those needs, as long as it has been slaughtered with appropriate animal welfare protection, goes beyond the interest of government. It becomes unethical when government requirements for such labeling are actually a sly way of promoting anti-religious views among those who are not religious.

Further, banning a method that is a requirement of a religion is probably a violation of religious freedom, unless there is a compelling public health, safety or welfare issue involved. This has never been demonstrated.

If precautions need to be taken to foster more humane slaughter, then some kinds of regulations should be enforced at the place and time of slaughter to minimize inhumane kills, but these regulations and enforcement issues would not necessarily involve labeling of meat unless all meat is subject to clear labeling of how it was slaughter and a system is put in place for all meats to insure the integrity of the final label.

To understand the very real rhetorical challenges in labeling meat according to the method of slaughter see Appendix VI. All methods of description either conceal the real pain of the process or reveal so much as to provoke disgust and offense.

3. Being Respectful of Secular and Religious Differences

All slaughter systems (secular and religious) should be audited and quantitative measurements routinely made of the slaughter and process of getting the animal to slaughter. Video auditing of all slaughter systems is a worthy goal (see Dr. Grandin's statement in Appendix I. Please note: These systems are close-circuit secured systems that go directly to the auditing firm. In the US the company doing this work has its personnel trained and supervised by Dr. Grandin. The question of releasing this information to the company, the slaughtermen, or even the public is a policy issue that needs to be addressed separately from the narrow focus of the video-auditing being discussed here.)

The standards need to be worked out in a **real** dialog between the scientific community including scientists from many fields outside of the narrow animal welfare community, especially including those working in the meat industry and for the religious slaughter part including representatives from within the religious communities who are knowledgeable about religious slaughter from both a religious and practical point of view.

If there are problems in any of these systems, the effort needs to be focused on correcting the problems in an appropriate manner. Incentives to encourage improvements and to adopt newer, better systems are needed. Many of the issues discussed above are examples of issues that affect slaughter but improving them in almost all cases will not run up against problems from the religious establishment.

However, such systems, particularly the ones that are not working properly, cannot and should not be used to judge the *inherent potential* of any slaughter system to humanely slaughter animals, including religious systems. Until the best possible version is evaluated scientifically, the true potential of a slaughter system CANNOT be evaluated. (And in the future with new systems, the evaluations will be needed again).

4. Responsibilities of the Scientific/Engineering Community

The scientific/engineering community needs to work together with the Jewish and Muslim Communities to make sure that the animal welfare during religious slaughter is done in the best possible way **consistent with religious requirements** as determined by the local religious leadership. Please note that both Judaism and Islam are dynamic religions. Both have a great deal of internal diversity. So, just as one cannot generalize one slaughter system to all slaughter systems, one cannot selectively choose the standards of one subgroup within the religion and generalize it to all groups within the religion. So, for example, many of the attempts to show that some Muslims accept stunned slaughter has no bearing on the views and needs of other Muslims who reject that position.

However, it is also probably fair to expect that the religious communities will take on the responsibility of assuring the best possible religious slaughter procedures are used consistent with religious law. By working in a positive way with the scientific/technical community, animal welfare can be optimized.

The scientific/technical community needs to standardize the methods and terminology that must be presented for reporting all slaughter methods in sufficient detail so that what actually occurred

can be critically evaluated. And the validity of various measurements will require collaborative work across a broad base of scientific disciplines. This is a role that a governmental body supporting scientific standards development might undertake. Is the European Food Safety Agency (EFSA) the logical organization to do this work? Can DialRel actually be expanded to carry out this work in a fair and objective manner? Possibly DialRel should begin this process with a team that is broader than its current makeup and then have its work vetted by EFSA.

5. The Role of Government

The role of government in this setting is challenging. Governments should work with scientists and industry to set realistic standards. Governments should work with religious groups respecting their free exercise of religion, while limiting practices that might be religiously acceptable but widely understood to be abusive, unsanitary or unfair. This is best done when viable alternatives are made available and support is provided both technically and possibly economically. In the US Dr. Grandin has been successful in working with the religious community and the slaughter industry to eliminate shackling and hoisting as a means of cattle slaughter.

6. Practical Steps to Improve Religious Slaughter

The most comprehensive practical information on how to do religious slaughter well is found on Dr. Temple Grandin's web site. It contains tests and practical suggestions on how to do religious slaughter well (www.grandin.com). Our own work with Dr. Grandin has focused on small scale slaughter, both religious and non-religious, such as that which would occur on farms, which is not permitted in Holland, or in small slaughter houses (www.spiritofhumane.com). This is a work in progress that would greatly benefit from assistance by more members of the scientific community working with the industry, the non-governmental organizations, and the government agencies to both further this work and to disseminate the results to appropriate audiences in various languages.

What are some of the issues that need to be considered when looking at and evaluating religious slaughter (Shechita for kosher and Zabiha for halal) and the process of preparing animals for such slaughter? How do we as responsible scientists help both governments and the religious leadership in the Jewish and Muslim communities to do the best possible job? How much of the literature that points at problems about religious slaughter actually are reporting on failures of one or more of the items discussed below? Unfortunately, many of the issues raised are actually in the realm of plant management and are not directly related to the fundamental religious slaughter issue that is the subject of the proposed legislation in Holland.

A. Pre-Restraint Handling

Pre-slaughter handling needs to be optimized for all slaughter facilities – this includes management attitude, facility and equipment design, maintenance, worker training and animal selection. Equipment must be sized appropriately and may need to be designed differently for different types of animals. Calm animals are needed for religious slaughter – how do we assure that this occurs? Some animals may not be appropriate for use in religious slaughter, e.g., extremely wild cattle (Grandin, personal communication). How do we identify the appropriate

animals ahead of time? What equipment and procedures for moving animals to slaughter work best to assure that calm animals are presented to the religious slaughter person? The work of Dr. Grandin provides lots of answers; the challenge is to work with the industry to implement these items.

B. Restraint

The method and/or equipment used to restrain the animal for slaughter should be assessed and designed for the specie and its variability in sizes. Any equipment must hold the animal firmly so it is restrained but not so firmly that it is painful. The slaughterman should be able to access the head of the animal easily to make the cut. Access should be for both right and left handed slaughterman working at an appropriate height to make the cut comfortably. Light and noise levels should be controlled to create a calming environment for the animal.

C. The Slaughter Man

How do we improve the slaughter man's "scientific" understanding of animal welfare and animal handling? How do we as scientists help the religious community to respectfully train their slaughter men to incorporate changes in their practices that are totally consistent with the religious requirements and take into account the best available scientific knowledge? We need to work closely with religious leaders so this is done right. It may also be appropriate to develop programs to assure that the religious slaughtermen are properly licensed. Again a joint approach involving industry, government and the religious community might accomplish this goal more rapidly and successfully. The Jewish slaughterman receives extensive training in the practical aspects of the slaughter including how to most exquisitely sharpen the knife specifically designed for slaughter. The Jewish community has indicated a willingness to do more to work with the Muslim community and the slaughter industry to share these valuable knife sharpening and handling skills.

D. Improving the Cut

According to Dr. Grandin (personal communication) a more aggressive cut closer to the jaw leads to more rapid insensibility, i.e., between the thyroid cartilage and the cricoid cartilage. How is a good cut measured physically? A possible approach might be to measure the number of strokes and check the cut afterwards: where were the major pipes cut and how "deep" was the cut of each pipe. Has this ever been carefully tracked and correlated with animal responses? Is there any reported literature that gives that information other than Dr. Grandin's observations on this issue? How do we then train Muslim and Jewish slaughtermen to consistently optimize their cuts? These are areas where DialRel and the scientific community could take some real leadership.

E. Special Muslim Slaughter Issue

Because all adult Muslims can slaughter, there is a need for us as scientists to work with many more people who are operating on a much smaller scale of slaughter. There is a need for a more community wide education in animal handling and proper slaughter techniques. (See www.spiritofhumane.com.) However, the focus initially should be on working with the professional Muslim slaughtermen, most of whom do an excellent job.

F. Upright versus Upside-Down Positioning of the Animal for Religious Slaughter

From the American Meat Institute (AMI) Recommended Animal Handling Guidelines for 2005: [Animals] that are ritually slaughtered without prior stunning should be restrained in a comfortable upright position. ... In a very limited number of glatt Kosher plants in the United States and more commonly in South America and Europe, restrainers that position animals on their backs are used.” For information about these systems and evaluating animal welfare, refer to www.grandin.com (Ritual Slaughter Section). This is an excellent example of where more progress was made by working with the religious community rather than trying to dictate standards that were unacceptable. This permitted scientists to work with the community to optimize the quality of the upside down slaughter, Such a success has been achieved in the plant in Postville, Iowa, which is the only kosher plant in the United States using an upside down pen.

Glatt is a higher standard for kosher related to the post-slaughter internal inspection of the animals. It has become normative for the majority of Orthodox consumers. Although the actual standard does not relate to the slaughter act, this normative Orthodox community does not accept either pre- or post-slaughter stunning.

G. Neck Washing

The Jewish slaughterman needs to carefully check the neck of the animal to be sure it is clean and will not damage the knife or cause a mis-cut of the animal before he does his cut. If necessary, a work person needs to wash the neck. Would there be a benefit to having the animals washed ahead of time for both kosher and halal so that especially with upside down slaughter the time to the start of slaughter is minimized? Recent work in New Zealand to develop such equipment may make this possible in the near future.

Dr. Grandin (personal communication) has observed that when a good rotating pen is used, that the animal may have a period of about 10 seconds or so where the animal is sufficiently disoriented that it remains calm. This observation needs to be verified and, if true, full advantage taken of the situation.

H. Vocalization

Cattle vocalization according to Dr. Grandin is the most useful measure of how the cattle are responding to their handling, the environment and the equipment being used [AMI, 2010]. Cattle vocalization percentages should be three percent or less of the cattle in each area such as the crowd pen, lead up chute and restraint device. A slightly higher vocalization percentage (5% vs 3%) is acceptable in the restraining box for religious slaughter because the animal must be held slightly longer in the restraint device (prior to slaughter) compared to conventional slaughter. If it is higher than 5%, it would suggest that there is significant room for improving the process of preparing animals for slaughter without having to deal with the actual slaughter. A 5% or less vocalization score can be reasonably achieved [even for religious slaughter performed in the upside down position, which is clearly slower than upright]. The higher percentage is a reflection of the fact that a certain amount of vocalization will occur randomly and is not due to a failure of the equipment. Thus, the figures are adjusted to take this into account. Note that vocalization does not work for sheep and goats.

Animals must be completely insensible before any other post-slaughter procedure is performed (e.g., shackling, hoisting, cutting, etc.). Practical standards for determining insensibility in the

slaughterhouse need to be developed for each type of animal. If the animal does not become insensible, it should be stunned with a captive bolt gun or other apparatus and designated as non-Kosher or non-Halal if required by the religious authorities.

I. The Slaughter Knife

The knife needs to be designed to specifically optimize the process. Ideally it should be at least twice the length as the diameter of the animal's neck and quite "straight". It must be extremely sharp (an important part of the training of slaughtermen needs to focus on knife sharpening – and this is absolutely critical for good religious slaughter). The knife for mammals needs to ideally be checked before and after EVERY slaughter. This is a major part of the training of a Jewish slaughterman. The Muslim community in general has been very receptive to both changing their knife to meet Dr. Grandin's standards and to the idea of further training in knife sharpening. Much of the research on religious slaughter (often labeled as un-stunned slaughter) has not used such a knife nor assured that it was sharpened to the degree required for Jewish slaughter. Again this is an area where cooperation can lead to a much better slaughter. For an example of such a knife please see www.spiritofhumane.com . It appears that un-stunned slaughter is used to indicate that the work was not done meeting religious standards, but the discussions in many of these papers extend to religious slaughter, suggesting that the term is being used improperly. The failure to actually do a religious slaughter is a serious criticism of the work on which proposed anti-religious slaughter regulations are based.

J. Number of Strokes

As long as it is continuous cutting, it is considered to be acceptable in both religions. However, Dr. Grandin has shown that a more rapid slaughter with fewer strokes leads to more animals becoming insensible quickly (Grandin, personal communication). This requires working with the slaughtermen and the religious leadership to improve the quality of their work. Interestingly, even some of the videos of those opposed to religious slaughter show some very good cutting without excessive back and forth motions. This was very obvious in the YouTube video prepared by the Dutch Animal Party's Scientific Bureau, the Nicolaas G. Pierson Foundation (<http://www.zocial.tv/today/Nonprofit/5711429/religious-slaughter-without-stunning> and <http://www.youtube.com/watch?v=CczdgmHAzOg>),

K. Ergometrics:

Can the handle of the knife be better designed to help the slaughtermen – different knives for upright and upside-down slaughter? This is an area where some limited funding might lead to real improvements. The knife designed by Spirit of Humane for halal and humane small-scale slaughter has been designed to be more ergonomic than traditional knives but has not specifically been able to take into account the issue of compatibility with various slaughter systems with respect to the position of the slaughterman and the system.

L. Endorphins

Good religious slaughter may actually be more humane than "humane slaughter" The concept is that no pain occurs with a very sharp cut [this requires better, manual sharpening and honing than with a mechanical knife sharpener, resulting in knives with surgical sharpness.] The release of endorphins occurs if the animal is unstressed (which is, as we have seen, required for kosher slaughtering). Animals die on a "high" [like "runner's high"]. The anecdotal fact that many times

a cut using a very sharp instrument does not lead to immediate pain for humans reinforces this hypothesis. Postulate: The process leading to endorphin release is only successful if the animal goes into slaughter unstressed, which is mainly under the control of and the responsibility of the plant management. This needs a lot of critical research although Dr. Grandin has observed this behaviorally (See her quote below).

M. Time to Collapse

A good system needs to get the animal both unconscious and insensible properly and quickly. (A consensus is needed, i.e., this is really a policy issue and not a scientific issue as to the time that a religious slaughter is considered failed.) It seems to be that 45 seconds for cattle and 30 seconds for smaller ruminants and poultry (DialRel recommendations) is the appropriate maximum acceptable time for visible unconsciousness to occur, i.e., the collapse of the animal. In a good system Dr. Grandin has observed that the average is 17 sec and the longest time was 33 sec (Grandin, personal communication). In bad systems, it is possible when things are really poorly done that animals may have an extended time before collapse. This is totally unacceptable. However, procedures to stun the animal if it has not become unconscious after 45 second to 1 minute should be in place in all plants undertaking religious slaughter. However, comparable discussions of how long it takes to stun an animal after mis-stuns and whether such animals should be given time to calm down before proceeding further are never discussed. Dr. Grandin (personal communications) has indicated that in her observations the worst case an animal needed to be stunned 6 times. But these situations that should not happen and need to be dealt with by the plant management, although they do serve as example of bad practices that need to be corrected. Again, their presentation in scientific discussions is often used to suggest that the system is inherently bad – which is a misuse of the information but is why such examples are constantly cited.

Behavioral observations of properly slaughter animals (see Dr. Grandin's quote above) also suggest that the animal during this period is not struggling. If it is dying calmly, is the time to collapse the most important parameter? Possibly not. The quality of the process of becoming unconscious may be more important than the time. There is a need to then agree to stun any animal that is not collapsed after that agreed upon time or if it is visibly stressed even if the animal becomes unacceptable for kosher or halal.

At least one “Temple Grandin approved” plant (i.e., one of the excellent plants in Canada) is using this standard and routinely getting over 95% of the cattle to collapse in about 30 sec. When designing any official audit standard after the appropriate research has been done, it is important to be sure that the audit is explained to the religious folks and that nothing in the standard or in the auditor's actions would appear to disturb/distract or rush a slaughterman so that the quality of the workmanship goes down. It is also important that audits be done with the support and involvement of the religious leadership.

7. Some Further Research Needs

There is a need to understand the process by which “endorphins” (naturally occurring opiates) function in animals at the time of slaughter. The role of the SHARP cut in optimizing endorphin

release needs to be documented. A way to measure the sharpness of a knife quantitatively needs to be developed to determine how sharp a knife needs to be for it to be used successfully?

Detailed animal physiology, biochemical, and behavior measurements are needed for each system where during religious slaughter animals are losing the ability to support themselves in 30 seconds or less (preferably 20 sec or less). And what is the time to functional unconsciousness that cannot be exceeded and is agreed upon by all the stakeholder groups?

In interpreting various scientifically measured parameters with respect to slaughter, it seems that there is a need to determine whether the interpretation of these parameters is valid for an animal with rapid blood loss compared to situations where blood loss does not occur.

It appears from reviewing some of the reports including the Dutch literature review discussed in detail below, that many scientists in the field have real questions about various brain wave studies and exactly what information in fact can be ascertained from them. This needs to be resolved before the reliability of such measurements is accepted.

The issue of defining the words “unconsciousness” and “insensibility” needs to be addressed critically and a consensus on the use of each word reached. Right now it is often hard to distinguish their meaning although they are clearly not being used in most research papers as synonyms but are sometimes used inconsistently which confuses the issues. The term “unconsciousness” should be used when the animal is no longer able to maintain its posture and is therefore not awake. It may be hung on the line for further bleeding at that time. It is assumed that at that point it also does not feel pain (which needs further research to confirm). The term “insensibility” should be used as a practical measure (i.e., the loss of all *voluntary* reflexes), which defines when the animal is ready for further processing.

Again, the research needs to carefully separate the actual religious slaughter needs from a number of extremely important issues that are not “religious requirements” but which confound the research results, e.g., the people, the facility, the equipment, and the non-slaughter stress of the animals need to be optimized before looking at the impact of the religious slaughter procedure.

8. Problem Equipment

Certain practices (not the religious slaughter itself) may need to be banned or phased out with the consensus of the religious community, e.g., shackling and hoisting (banned in the EU as of January, 2013) and its variants, and the Weinberg pen are two possible examples. Ideally with dialog and with respect, the religious communities will support these changes. (Many already do.)

9. A Reminder about Standard Stunning Procedures

With standard stunning procedures – if the animal is not stunned on the first try, it is *extremely stressful*. *Sometimes it takes as many as 6 tries to eventually stun the animal.* (The latter is definitely worst case data.) The new US AMI (American Meat Institute) expectation (Grandin,

2010), as also accepted by the FMI (Food Marketing Institute, supermarkets) / NCCR (National Council of Chain Restaurants) Animal Welfare Technical Committee still permits 5% of the animals to be “missed” on the first try with regular slaughter. (And most animal activist organizations in the US accept this standard. In the US this seems to be a universally agreed upon slaughter standard and therefore it is recommended to Holland and the European Union. It also includes a religious slaughter standard that might also be adopted.) In fairness to the industry, in recent years the industry average for good plants is closer to 3% failure on the first attempt in the US. But that’s still a lot of animals that are mis-stunned. If one takes that number and uses it as a benchmark, then how many animals in Holland would be poorly handled in regular slaughter? How does this compare with the number of animals subject to religious slaughter? Thus, more animals are likely to suffer from mis-stunning than the total number of animals killed kosher and possibly even halal. Before banning religious slaughter, shouldn’t Holland consider adopting a slaughter standard across all forms of slaughter and then work with the entire industry to raise the animal welfare standards of all Dutch slaughterhouse? (Although not as comprehensive, it should be noted that the OIE standards for animal welfare recognize religious slaughter and make suggestions for how to do it right.)

Some of the methods that were used for penetrating captive bolt stunning were implicated in helping to spread brain tissue throughout the animal. These procedures have been changed once this was realized that this was unsatisfactory as part of the management of bovine spongiform encephalopathy (commonly called Mad Cow Disease).

10. Quality of the Current Research Reports

Can one really determine how the religious slaughter was done by reading the literature? When the investigator answers a question about the details of the religious slaughter with an “I don’t know”, what does that suggest? (This has happened to me twice in discussions of religious slaughter with noted European animal welfare researchers.) This would suggest that the literature studies do not meet the standard of sufficient information so that the experiment can be repeated or the data cleanly interpreted, which is surprising for such important questions that have taken up so much research effort and expense – if objective scientific answers were really desired? For scientific credibility one needs to do better than that.

11. Conclusion

In the future will good science show that the most humane slaughter may well be religious slaughter? All research on the issue of religious slaughter (as opposed to evaluating a particular situation) needs to be done on a system that is operating properly and provides the best possible condition for slaughter – only then can the potential of religious slaughter be properly evaluated by both the religious community and the scientific community. Hopefully then there can be an open-minded scientifically-based discussion of various slaughter methods.

The process also needs to obtain the full buy-in from all the stakeholders. A process that imposes rules on the religious communities from the outside violates their Freedom of Religion and only serves the interests of those who wish to destroy democratic processes and those religious freedoms. The religious communities in some countries have done an excellent job of

supervising (and sometimes licensing) of their slaughter personnel – the religious community in other countries need to be encouraged to develop such systems.

Together they must work to improve all slaughter, religious and non-religious, for the benefit of the animals and society. This focus on religious slaughter draws attention away from the important work that needs to be done.

You have not discussed aspiration (inhaling) of blood into the lungs after the cut. Can I assume that in our situation (upside down pen) this issue does not occur as the blood rushes to the lowest point away from the lungpipe? **The Gibson papers raise issues and so does Temple's work. So this is a work in progress but elsewhere there are aspects dealt with that question its importance.

Acknowledgments

I would like to thank a number of readers in both the scientific and religious communities for their input and suggestions.

Additional Notes on Dr. Regenstein:

In addition to his appointment in the Department of Food Science, he is in the Field of International Development and serves as an Adjunct Professor in the Department of Population Medicine and Diagnostic Sciences in the College of Veterinary Medicine. Among the courses he teaches is "Introduction to Animal Welfare" in the Animal Science Department. In 2010 he was invited to speak at the European Union's DialRel (Dialogue on Religious Slaughter) meeting in Girona, Spain. Dr. Regenstein has been a member of the Food Marketing Institute (FMI) and the National Council of Chain Restaurants' Animal Welfare Technical Committee since its founding. Dr. Grandin is also a member of this committee. He is working with Spirit of Humane in Wisconsin to design low cost halal/humane slaughter equipment based on the work of Dr. Temple Grandin, who has advised the project (www.spiritofhumane.com). Dr. Regenstein wrote a grant proposal that permitted Dr. Temple Grandin to visit Cornell for a week for five years ending in 2010.



List of references (incomplete):

EBLEX (2009): The Quality Meat Supply Chain for the Muslim Consumer (DVD).

Gibson, T. J.; Johnson, C. B.; Murrell, J. C.; Chambers, J. P.; Stafford, K. J.; Mellor, D. J. (2009a): Components of electroencephalographic responses to slaughter in halothane-anaesthetised calves: Effects of cutting neck tissues compared with major blood vessels. *New Zealand Veterinary Journal* 57, 84-89.

Gibson, T. J.; Johnson, C. B.; Murrell, J. C.; Hulls, C. M.; Mitchinson, S. L.; Stafford, K. J.; Johnstone, A. C.; Mellor, D. J. (2009b): Electroencephalographic responses of halothane-anaesthetised calves to slaughter by ventral-neck incision without prior stunning. *New Zealand Veterinary Journal* 57, 77-83.

Gibson, T. J.; Johnson, C. B.; Murrell, J. C.; Mitchinson, S. L.; Stafford, K. J.; Mellor, D. J. (2009c): Amelioration of electroencephalographic responses to slaughter by non-penetrative captive-bolt stunning after ventral-neck incision in halothane-anaesthetised calves. *New Zealand Veterinary Journal* 57, 96-101.

Gibson, T. J.; Johnson, C. B.; Murrell, J. C.; Mitchinson, S. L.; Stafford, K. J.; Mellor, D. J. (2009d): Electroencephalographic responses to concussive non-penetrative captive-bolt stunning in halothane anaesthetized calves. *New Zealand Veterinary Journal* 57, 90-95.

Grandin, T. (2010: Recommended Animal Handling Guidelines and Audit Guide June 2010 Edition)

Grandin, T. (2011): www.grandin.com. Recommended Ritual Slaughter Practices.

Grandin, T.; Regenstein, J. M. (1994): Religious slaughter and animal welfare: a discussion for meat scientists. *Meat Focus International*, 115-123.

Jacoby, L. and Moses, J. (2011): www.spiritofhumane.com . Spirit of Humane.

Kijlstra, A. And Lambooij, E. (2008): Report 161. Ritual Slaughter and Animal Welfare. Animal Sciences Group at Wageningen UR.

Lambooij, E., van der Werf, J.T.N., Reimert, H.G.M., and Hindle, V.A. (2010): Report 398. Report on restraining and neck cutting or stunning and neck cutting in pink veal calves. Animal Science Group at Wageningen UR.

Regenstein, J. M. (2000): Humane (Halal) on-farm slaughter of sheep and goats. www.sheepgoatmarketing.info/news/HumaneSlaughter.pdf , Northeast Sheep and Goat Marketing Program, Mike Thonney, Department of Animal Science, 114 Morrison Hall, Cornell University / Ithaca, NY 14853-4801, 607.255.2851 / mlt2@cornell.edu,

Preliminary Report: Regenstein, Cornell, May 23, 2011

Regenstein, J.M.; Chaudry, M.M.; Regenstein, C.E. (2003): The Kosher and Halal Food Laws. *Comprehensive Reviews in Food Science and Food Safety* 2, 111-127.

Rosen, S.D. (2004): Physiological Insights into Shechita. *Veterinary Record* 154, 759-765.

Appendix I

Maximizing Animal Welfare in Kosher Slaughter

Opinion

By Temple Grandin

Published April 27, 2011, issue of May 06, 2011.

There are legislative attempts around the world to require stunning of animals prior to religious slaughter. I do not get involved in the politics of this issue, but the following discussion may help clarify where there are problem areas.

Over the past 30 years I have worked closely with the kosher industry to ensure that religious slaughter is performed in as humane a manner as possible. The issue of stunning, in my view, is not the most important issue when it comes to ensuring the welfare of animals before they are slaughtered. But it is critical to recognize that performing kosher slaughter with an acceptable level of welfare *does* require more attention to the procedure's details than slaughter in which the animal is stunned.

There are two animal welfare issues when slaughter is performed without stunning. They are the method used to restrain the animal and the throat cut itself.

These issues are particularly relevant when it comes to cattle. Poultry can be slaughtered easily with a sharp knife, and there is no need for stunning. Sheep are smaller than cattle and easier to restrain and kill quickly. A lamb that is slaughtered with a sharp knife out on the farm, even without stunning, probably has better welfare than a lamb that has to ride on a truck to a slaughter plant. Due to anatomical differences in the blood vessels in the neck, cattle take twice as long as sheep to lose consciousness after the cut, and their size makes them difficult to restrain.

Some of the worst animal welfare problems in the kosher industry are the stressful methods of restraint that are still being used in some slaughterhouses. In the United States, there are still some kosher plants that hoist conscious animals by one rear leg. Fortunately, most of the large American kosher plants have stopped using this traumatic method.

In South American kosher slaughterhouses, however, the handling practices are often atrocious. The live cattle are shackled and dragged and then held down by several people. The methods of restraint are so bad that it is impossible to determine how the animal is reacting to the throat cut. Large amounts of kosher beef are imported into this country from plants that are using these barbaric methods of restraint.

Even when a plant has decent restraint equipment to hold the animal in a more comfortable position, it needs to be operated correctly. This requires management that is committed to good animal treatment.

I have observed that when kosher slaughter of cattle is done well, there is almost no reaction from the animal when the throat is cut. Flicking my hand near the animal's face caused a bigger reaction. When the cut is done well, 90% or more of the cattle will collapse and become unconscious within 30 seconds.

There are new scientific studies that show there are welfare concerns when animals are slaughtered without stunning. New Zealand researchers conducted a study on calves with a new EEG brain wave method that indicated that the knife cut caused pain. In this study, however, they used a machine-sharpened knife that may have been too short. A knife that is too short will cause gouging of the wound. The results of this study clearly show that the knife they used was not acceptable. To this date, a similar study has not been done with the special long kosher knife.

Another study has shown that one of the most difficult welfare problems to solve is aspiration (inhaling) of blood into the lungs after the cut. Cattle continue to breathe after the throat is cut. There is much variation in the percentage of animals that aspirate blood. It may be possible to improve methods and reduce this problem. Aspiration of blood is an issue that must be fixed to have an acceptable level of welfare. It will require both research and practical experimentation with technique to solve this problem.

Finally, there needs to be accountability to ensure that both restraint and slaughter are done correctly. Over the years, I have become disgusted by the frequency with which procedures in a given plant seem perfect when I am visiting, but as soon as I have left an undercover video surfaces that reveals bad practices. This has happened in both conventional and religious slaughter plants.

To prevent this problem, I am a big advocate of video auditing over the Internet. An outside auditing company can view video from a plant and evaluate its practices using an objective scoring system. Some of the variables that can be measured are electric prod use, percentage of cattle vocalizing (bellowing) and acts of abuse. Video auditing is now being used in many large, conventional slaughter plants. Unfortunately, all kosher plants [in the US] have resisted video auditing.

Kosher slaughter of cattle requires special care. While some kosher plants have done well, and many others are improving, too often kosher plants have been very badly managed compared to many of the big conventional plants.

In order to maximize animal welfare, kosher slaughterhouses need to take the following steps: 1) eliminate stressful cruel methods of restraint such as dragging, shackling and hoisting or leg clamping; 2) keep animals calm before slaughter, since an agitated animal is more difficult to kill and takes longer to become unconscious; 3) perform the cut immediately after an animal's head is restrained; 4) use restraining devices that hold animals in a comfortable upright position; 5) perform collapse scoring to keep track of the proportion of animals that quickly lose consciousness; 6) use video auditing by an outside firm, and practice transparency by streaming the video to a webpage so that the public can view it.

Adhering to these practices would enhance animal welfare, and all these steps could be implemented without transgressing the requirements of religious law. The kosher industry has an opportunity to show the world that it is doing things the right way.

Temple Grandin is a professor of animal science at Colorado State University and a designer of livestock handling facilities. She is the author of "Animals Make Us Human: Creating the Best Life for Animals" (Houghton Mifflin Harcourt, 2009).

Appendix II

Discussion of research that shows that Kosher or Halal Slaughter without stunning causes pain

by Temple Grandin
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Updated February 2010

A study done in New Zealand in 2009 shows that slaughter without stunning causes pain. A new EEG (brainwave) method was used, which can determine when an animal is feeling pain. In these experiments, lightly anesthetized calves were cut with a very sharp knife that was 24.5 cm long. The weight of the calves was 109 to 170 kg. One reason why the calves were lightly anesthetized was to prevent animal movements (movement artifact) from changing and distorting the EEG patterns. The experiments showed that the calves would have been experiencing pain during the cut (Gibson et al, 2009 ab).

The knife used in this experiment was much shorter than the special long knives that are used in Kosher slaughter. The use of a shorter knife may possibly have had an effect on the painfulness of the cut. The author has observed that shorter knives, where the tip of the knife gouges into the wound during the cut, will cause struggling. An animal may also struggle when the wound closes back over the knife during the cut. Since the calves were anesthetized, it was impossible to observe behavioral reaction during the cut. From reading the methods sections in the papers, it was not possible to determine if the wound was held open during the cut, which may help reduce pain. The knife used in this experiment was similar to many of the knives the author has observed being used for halal slaughter. The special long knife used in kosher slaughter is important. When the knife is used correctly on adult cattle, there was little or no behavioral reaction (Grandin, 1992, 1994). Barnett et al (2007) reported similar reactions in chickens. Only four chickens out of 100 had a behavioral reaction. Grandin (1994) reported that the behavioral reaction of cattle was greater when a hand was waved in their faces compared to well done Kosher slaughter. All of the cattle were extensively raised animals with a large flight zone. They were all held in an upright position in a restraint box. The results of this study clearly show that the use of a knife with a 24.5 cm long blade definitely causes pain. Another factor that may have had an effect on pain was the use of a grinding wheel to sharpen the knife instead of a whet stone. There is a need to repeat this experiment with a Kosher knife and a skilled shochet who obeys all the Kosher rules for correct cutting.

Aspiration of Blood

Research also shows that cattle aspirate (inhale) blood into the lungs during Kosher and halal slaughter. This can vary from 36% to 69% (Gregory et al, 2008). The cattle were restrained in an upright position. The author has also observed aspiration of blood during Kosher and halal slaughter. It is the author's opinion that aspiration of blood is more likely to be a serious welfare problem for cattle, because bovines take longer to lose sensibility (consciousness) compared to sheep (Baldwin, 1971 and Blackmore, 1984). This provides more time for cattle to aspirate blood

compared to sheep. Sheep lose sensibility more quickly due to differences in their blood vessel anatomy compared to cattle (Baldwin, 1971; Baldwin and Bell, 1963). See other articles on www.grandin.com on slaughter methods. The Gregory et al. (2008) data was collected in commercial slaughter plants. Further research is needed to determine why some cattle aspirated blood and others did not. Possibly, improving procedures to facilitate rapid loss of sensibility may reduce aspiration of blood. This needs further research.

All of this research needs to be looked at in the perspective of the entire process. Abusive handling practices prior to slaughter and highly stressful methods of restraint may cause more suffering than the actual slaughter itself. The author has been in dreadful places where large, 600 kg cattle were hung up by one leg and they were all thrashing and bellowing. The OIE slaughter standards state that these stressful methods of restraint should not be used. Plants that use stressful methods of restraint such as shackling and hoisting or shackling and dragging need to stop using these abusive methods.

References

- Barnett, J.L., Cronin, G.M., and Scott, P.C., 2007. Behavioral responses of poultry during Kosher slaughter and their implications for bird's welfare. *Veterinary Record*. 160:45-49.
- Baldwin, B.A., 1971. Anatomical and physiological factors involved in slaughter by carotid section; Humane killing and slaughterhouse techniques. Universities Federation for Animal Welfare. Potters Bar, Herts, UK. pp 34-43.
- Baldwin, B.A. and Bell, F. R. 1963. *Journal of Physiology*, 167: 448-462.
- Blackmore, D.K., 1984. Differences in sheep and cattle during slaughter. *Research in Veterinary Science*. 37:223-226.
- Gibson, T.J., Johnson, C.B., Murrell, J.C., Hulls, C.M., Mitchinson, S.L., Stafford, K.J., Johnstone, A.C., and Mellor, D.J., 2009. Electroencephalographic responses of halothane-anaesthetised calves to slaughter by ventral-neck incision without prior stunning. *New Zealand Veterinary Journal*. 57:77-85.
- Gibson, T.J., Johnson, C.B., Murrell, J.C., Chambers, J.P, Stafford, K.J., and Mellor, D.J., 2009. Components of electroencephalographic responses to slaughter in halothane-anaesthetised calves: Effects of cutting neck tissues compared to major vessels. *New Zealand Veterinary Journal*. 57:84-89.
- Grandin, T., 1992. Observations of cattle restraint devices for stunning and slaughter. *Animal Welfare*. 1:85-91.
- Grandin, T., 1994. Euthanasia and slaughter of livestock. *Journal of the American Veterinary Medical Association*. 204:1354-1360.
- Gregory, N.G., Von Wenzlawowicz, M., and Von Holleben, K., 2008. Blood in the respiratory tract during slaughter with and without stunning in cattle. *Meat Science*. 82:13-16.

Appendix III

Statement of the Rabbinical Assembly of the United States Conservative Movement:

It has come to our attention that Rabbinical Assembly materials have been misused by the Party for Animals in their debate in The Netherlands regarding legislation seeking to ban shechitah. The paper in question, “A Stunning Matter” by Rabbi Mayer Rabinowitz was written in 2001 and is intended to be a resource for individual rabbis making determinations for their communities. It does not reflect the public policy of the Rabbinical Assembly and it is a mistake to cite it this way in political discourse.

Furthermore the way the teshuvah [responsa] was depicted is inaccurate. The paper addresses the question “Is it permitted to stun/bolt an animal after shechitah. The conclusion is that post-shechitah stunning is permitted. The paper does not, as implied by the Party for Animals, endorse the practice of pre-shechtah stunning.

We request that the Party for Animals retract their statement regarding our support for their legislation and refrain from using Rabbinical Assembly materials to mislead people in making their case.

Appendix IV

A critical review of the recent work reported in the New Zealand Veterinary Journal

The most recent work on un-stunned slaughter (i.e., not religious slaughter.) reported in the NZ Veterinary Journal (Gibson et al., 2009a,b,c,d) is an example of such a limited piece of work. It has many serious limitations. A list of some of those concerns is shown below:

The knife blade is rather short -- less than 10 inches long and the actual slaughter and the "pen" used for the slaughter are poorly described. The special equipment used is not shown. What about details about the actual slaughter cut – how many strokes and where on the neck? The head holder also doesn't seem to be doing the job right – too much movement? The training of the slaughter man is not given. Like so many of these papers, it does not give enough details about the religious slaughter (or un-stunned slaughter as they call it) to determine what really is happening, which violates the basic scientific principle that the work must be repeatable by others. (And if it is about un-stunned slaughter unrelated to religious slaughter why is religious slaughter mentioned so frequently?)

A broom stick was run gently across the animal as the supposed control. Why not use the back of the knife for a sham cut -- some pressure could be applied which would show what the impact of pressure without a cut has on the animal. This "sham cut" feels like it is no different than an untreated control. The knife was also sharpened using a mechanical knife sharpener. Who sharpens a knife with a mechanical knife sharpener?

Why is the heart rate so high for the first paper and much lower in the other two papers? It suggests that some of these animals were more stressed -- why should that be the case if the animals were not conscious? This is often observed for the convulsions after slaughter regardless of method. It also seems that the normal "sticking" of the animal after non-penetrating slaughter was never done thus this important control is missing.

They actually admit in one of the papers that the halothane might have an effect on some of the observations they have made -- my physiology is not good enough to follow all those arguments but that does raise the question of whether the methodology used for treating the animals interferes with appropriate data collection. It certainly is NOT identical to un-stunned slaughter.

The papers are VERY sloppy about how the words "unconsciousness", "insensibility", and "undoubted insensibility" are used. That is probably a key to the distortion of the discussion. The papers never actually establish an unconsciousness point, where it is accepted that the animal would not feel pain. According to the EU and common vocabulary, when the animal drops, it is unconscious and doesn't feel pain. And the papers also seem to reference a lot of the bad religious slaughter for the times they discuss with respect to time to insensibility. (Much longer than those of Dr. Grandin's recent work noted above.) Words like suffering are also thrown in to add a little drama. This is a word that needs to be defined and requires a great deal more research. It is not the same as "pain". And what exactly is psychological shock? A term used but not defined. And a lot of "wishy-washy" words, like "probably, likely, possibly" are scattered throughout the paper that leave one uncomfortable with the strong conclusions that are

being claimed by both the authors and others for the importance of these papers. *This is another concern with the use of the research literature – the results are often mixed, but the conclusions come out with strong definitive statements not supported by the research. Presumably the authors are hoping that the less scientific readers will only read the summary and/or conclusions.*

The whole business of occlusions (the issue of blood clots that prevent proper bleeding and the issue of blood being aspirated into the trachea and possibly beyond into the bronchii) seems to be muddled. Even when they occur according to these authors, they seem to have no effect on the outcome of the slaughter. They actually challenge the conclusions of others who believe this is a major issue. Dr. Grandin (personal communication) suggests that what is needed is the correlation of aspiration into the trachea and the time to drop. Also she has suggested that blood in the trachea may not elicit a response, while blood that actually goes into the bronchi before the animal is unconscious might have a negative impact. The issues of whether blood interferes with breathing in any systematic way and under what circumstances any stomach contents are expelled during slaughter is a complex issue. Especially the later is a concern for regular slaughter also where bleeding occurs after the animal is hung upside down. Clearly more work is needed to clarify these complex interactions.

The papers talk about possible errors in using the non-penetrating stunner -- what kind of experimentalists are they if they invoke "incompetence" and have a 28% failure rate of the stunner? That is considerably greater – over 5 times -- than the 5% that is acceptable for slaughter according to the AMI standards.

From a colleague more familiar with the physiological measurements:

I have yet to complete a detailed analysis of their EEG analysis but even at this stage, I would add ...that if you try to pursue the data points for single animals, especially in the attached paper, some of them have results that run in completely opposite directions and there is great overlap between the groups. I have major doubts about the statistical validity of their separability. Second, I believe that there is a considerable difference likely between the groups for movement artifacts which could per se also generate many of the differences in what is anyway a non-specific marker.

Dr Grandin's comments on these papers are found in Appendix II.

Appendix V

Scientific Review Of

Report 161: Ritual Slaughter and Animal Welfare (September, 2008) and Report 398: Report on Restraining and Neck Cutting or Stunning and Neck Cutting in Pink Veal Calves (September, 2010), by the Animal Science Group, Wageningen UR

The comments are based on the English version of the report as issued by Wageningen UR. Points mentioned previously will not be repeated in detail although many of these same concerns are found in these two reports.

Report 161. Ritual Slaughter and Animal Welfare.

Page 3. The use of the term “ritual rites” suggests a bias. These are methods of religious slaughter and the use of that term is preferred so as not to start by biasing the discussion.

The second paragraph assumes and takes as a given that there is “fear” and “pain”. Again if this is a scientific review, this should not be stated as a given and makes one question the sincerity (and completeness) of the review.

Page 6. The definitive statement that un-stunned slaughter is “at odds with animal welfare” is again a statement that makes the review less than credible.

The reference to the veterinary community is inappropriate. Ethics or morality is a branch of philosophy dealing with “reason” – so it is fine for anthropomorphic and pet centered veterinarians to feel that something is wrong, but that does not relieve them of their scientific obligation to do so objectively with proper evaluation of the data. Again the review seems to want to be sure to tell you that the data supports these inaccurate conclusions.

Page 7. The use of the word “suffer” again is prejudicial. Both the Jewish and Muslim religions are people-centered. They make exceptions for people under circumstances of extreme hardship. Thus, rabbis have the authority to accept practices that under “emergency” situations. But trying to say that these are “accepted” is extremely misleading and disrespectful of the religious traditions.

Page 10. Please note that the Royal Veterinary Society of Sweden in more recent years justified the continuation of the ban by studying one kosher slaughter system – the Weinberg pen. That same problematic pen seems to be everyone’s favorite when trying to justify negative attitudes towards religious slaughter. Again, they take a flawed system and present it as the norm, which to most people is unethical. The issue of Postville/Agri-Processing in the US is mentioned. In fact, working with Dr. Grandin, this plant is now operating in an acceptable manner. So yes, the key difference remains that in the US those of us involved in animal welfare work closely with the religious authorities and the plants to improve things rather than focusing on papers showing the most negative view of the worst systems.

Page 12. One of the improvements in marking religious foods has been the development of trademarked symbols so that consumers not only know the product is kosher or halal, but actually know who is doing the certification and are thereby able to determine whether a particular product meets their personal standard. Hopefully, this will become more and more common in Europe. Hopefully, this change will be encouraged by the authorities by assisting those agencies with a trademark to protect that trademark through the legal system.

Page 13. The Muslim community needs help with improving slaughter, particularly at the Feast of the Sacrifice where a large number of animals need to be slaughtered in a short time. But the fact that problems arise at that time does not mean that all religious slaughter should be banned. It should be noted that when Temple Grandin working with the McDonalds Corporation found plants out of compliance with the AMI standards, the plants were delisted – no one suggested that regular slaughter ought to be banned.

For a review of religious slaughter to focus on transport is highly suspect. This is important and many of the smaller slaughter houses probably employ systems that involve less than ideal transport. This is an issue to be dealt with but not in the context of religious slaughter.

The issue of slaughterhouse design is an important issue that needs to be worked on by the scientific and engineering community. The food inspection agencies ought to be involved in assuring that all slaughter plants, including religious slaughter plants, have the right equipment and that it is properly maintained to do slaughter properly.

Page 14. A very important statement is buried on this page: “Much more distress may be caused on the way to the slaughter than by the pain of the throat cut in ritual slaughter without stunning, and this aspect therefore deserves careful attention.” Again why the focus on the slaughter then? Why not focus on how best to deal with this component? This is not a religious slaughter issue.

Page 15. Again a lot of data on upside down slaughter without sufficient information to determine if the older type of unacceptable pens were used or whether one of the new and better designed rotating pens were used

The data shown is also questionable because of the lack of details that would allow one to relate the results to the equipment and conditions in the slaughter house.

Page 16. The belly lift is NOT a lift – it is not meant to support the animal and should not be used that way. The wording suggests that the authors are not aware of the effort Dr. Grandin has gone to in trying to teach the industry to not use the belly lift to lift the animal. Both a “V-restrainer” (not properly discussed but very clearly available and used as per the EBLEX (2009) DVD mentioned previously and the double rail lead to a very calming effect with animals It is easily observable. Since Malaysia was singled out earlier, they have just banned the mechanical slaughter of chickens and this is being phased in.

If a bird is immobilized but not stunned, then the procedure is cruel and should not be used. So the claim of any benefits of stunning would be lost.

The proper holding of birds for kosher slaughter has a calming effect on the birds.

Page 17. The exact role of the unique anatomy of cattle remains to be distinguished. The loss of blood pressure and the exact parts of the brain served by the back of the head system is more “postulated” than actually determined. And again this needs to be looked at with the highest quality religious slaughter, i.e., when done right, not when done wrong. The statement: “Differences of opinion exist about the blood flow direction through the vertebral artery after the throat cut (EFSA, 2004)” again shows how little information is really known.

This page does again present the opinions of those not accepting the basic assumption of the authors. They are to be thanked for recognizing this although it would be nice if they challenged their assumptions more carefully.

“The throat cut may evoke a pain response. Scientists have differing opinions about the degree of pain, fear and other discomfort. Grandin says that a throat cut that is skillfully executed without stunning while an animal is calm is not painful (Figure 7; (Grandin and Regenstein, 1994)). She reaches this conclusion on the basis that animals that are led to slaughter correctly and restrained effectively bleed out calmly after the cut, with no head or leg spasms. Rosen also considers that a throat cut without stunning does not necessarily cause the animals pain (Rosen, 2004).”

The next paragraph then quotes EFSA’s conclusion but provides no supporting data. The comments in the Appendices below I believe also address why this may not be a correct conclusion. However within this paragraph is the critical statement of other work: “On the other hand, Zimmerman notes that humans feel pain only several seconds or minutes after an accidental knife cut. This depends on factors such as how sharp the knife is, the depth of the cut, the length of the cut, and the type of metal [e.g., a knife versus galvanized sheet metal]. He also concludes that an animal slaughtered without stunning may go into shock, with the release of endogenous substances that would suppress any sensation of pain (Zimmerman, 2005). This supports the hypothesis that religious slaughter may in fact be more humane than other methods.

The report then goes on to cite another important idea, but raise a legitimate issue that has not been studied – but it is still a major admission that some of the critical information that is really needed has not been obtained to date: “This ‘stress-induced pain suppression’ is said to have evolved in prey as a mechanism for improving the species’ chances of survival. Serious injuries to animals are often caused by attacks from predators or fights with members of the same species. Rather than paying attention to its wounds, the animal would be more likely to survive by first seeing off the threat, for example by freezing, fleeing, or fighting back (Harris, 1996). It is unclear whether this form of pain suppression occurs in all animals of a given species. Without it, serious suffering would result.

Page 18. The report sums up Dr. Grandin quite nicely with the following statement: “The amount of pain caused by the incision depends greatly on the skill of the slaughterman and the quality of the knife. The pain sensation is difficult to measure, and opinions on the subject

therefore tend to be subjective. Grandin says that jerky movements of the restraint equipment and hissing noises cause more distress than the incision (Grandin, 2008), and she therefore recommends training employees in calm animal handling and a proper cutting technique, adapting equipment to suit the animals, and eliminating distractions that make animals balk.” This again highlights the need for better training and better management of slaughter and highlights the fact that the un-stunned slaughter needs to be properly managed.

The pooling of information from many different countries, particularly countries likely to have very different slaughter standards is highly questionable.

The situation in Australia is similar to Sweden. What is done is being done under duress (Rabbi M. Gutnick, Chief Rabbi of Sydney, personal communication).

The discussion of the head-holder again suggests that the work in this report is not using the latest and proper head-holders as designed by Dr. Grandin (please see her web site).

Page. 19. The throat cutting “under experimental conditions” is highly questionable as a way to gather statistical data. A lot more details and analysis is needed.

Another important comment is made on this page: “Measurable brain activity therefore persists longer in slaughter without prior stunning. However, it is invalid to equate loss of brain activity with the time at which animals lose sensibility, which may well have occurred earlier.” This actually raises questions about the use of the methods so heavily relied on by their research on veal evaluated above.

Page 20: And a statement on stress hormones that may be of value: “Shaw and Tume measured the same cortisol levels with and without stunning, which may have been because the blood samples were taken within fifteen seconds of the throat cut, while cortisol release from the adrenal gland begins only after several minutes (Shaw and Tume, 1992)” Clearly, cortisol levels are not a useful measure of stress related to slaughter.

The information for poultry is compelling but certainly suggests that kosher slaughter does not have a negative impact.

Page 22. The issue of a stun that causes paralysis without actual unconsciousness is very disturbing and suggests real limitations, essentially a breakdown in animal welfare, with the use of the light stun for commercial slaughter.

The Muslim world is a lot larger than the Arab world, which is only 20% of Muslims, and to many people's surprise have some of the weakest halal standards. They are not in the case of halal representative of the Muslim community.

Page 23. The statement: "Field studies indicate that up to ten per cent of executed stuns are ineffective." This is for mechanical stunning. Is this ground for banning mechanical stunning? It is certainly a lot more animals having poor welfare. The challenges with electrical stunning are also stated – and yes, work on improving shackles is needed. And for gas there is "pain and breathlessness", which is aversive behavior and therefore stressful and perhaps painful – so why is everyone pushing gas? The more complex system proposed may work in the laboratory but is going to be a lot harder to manage in the plants. From the point of view of the Muslim community there are suggestions that the gas stun/kill system may actually lead to death in many cases, which is totally unacceptable to the Muslim community. The animal must be alive at the time of slaughter – the challenge is to be able to prove this if an animal has been stunned in any fashion.

Page 25. *The conclusion page is a disaster. It returns to pre-conceived notions and is inconsistent with the documentation.* I guess the hope is that many readers will just read the conclusion.

Most of my objections have already been covered by statements made earlier. However, despite their best attempts to force the issues into their preconceived ideas, the authors do make one very important statement: **"The discomfort involved in ritual slaughter can be reduced by attending to details of the restraining methods, altering the design of slaughterhouses, using trained personnel, and performing regular slaughterhouse audits."** So here we have the authors' admission that they really don't have a basis for banning religious slaughter. And the authors admit that they really do not know much about what is happening in Holland. Their suggestions for how to slaughter without stunning include some good suggestions but also go beyond what is needed and helpful, and they delve into areas of marketing and policy that are beyond the scope of this paper, which again undermines the credibility of the work.

So again the truly rational conclusion is that work needs to be done to improve slaughter, both secular and religious slaughter. More time and attention to improving the situation by working together will be more expeditious and greater impacts on animal welfare than a lot of expensive studies on bad systems.

Report 398. Report on Restraining and Neck Cutting or Stunning and Neck Cutting in Pink Veal Calves.

Unfortunately pages are not numbered. Therefore I will consider the cover as page 1 and continue from there.

Page 2. Interestingly, just like the NZ work, the absence of keywords to suggest kosher, halal, or religious slaughter is surprising – reinforcing the idea that this work is not appropriate as an evaluation of religious slaughter.

Page 5. English Abstract. “... would have been likely to be perceived as pain in conscious animals.” But in fact this is not a given and is therefore questionable as a conclusion. And the final statement “The government should establish requirements for handling during ritual slaughter and facilitate a dialogue with those religious groups involved” is given with no basis. And shouldn’t the dialog occur first to determine if government requirements are actually needed?

Page 9. The English Summary. The difference between “electro-narcosis” and electrical stunning needs to be clarified. If electrical stunning, (i.e., the stun must be fully reversible) is not permitted then maybe the legislation that is needed is to permit electrical stunning. Other aspects in the summary are incomplete but whether these details are covered sufficiently in the text will be evaluated at the appropriate point in the text.

The final statement in the conclusion is exactly the major problem with this work. The corneal reflex (nictitating membrane in birds) according to Dr. Grandin is usually the final reflex to go before full insensibility (death) occurs. So it may be long after unconsciousness and therefore the relevance of this research becomes extremely questionable.

Page 10. Recommendations. The authors refer to only one type of upright restrainer, the most expensive one that is really for very high speeds. This equipment can go up to 215 head per hour for religious slaughter. There are many other alternatives that may be more cost effective under other circumstances.

The final data takes the worst case numbers and muddles the words unconsciousness with insensitivity. And it also immediately assumes that the animals are experiencing pain. All of this detracts from the credibility of the work.

Page 13, A large amount of data is presented on the Weinberg pen, which we accept as being a very poor piece of equipment at this time. So all of this data may be totally irrelevant when evaluating modern equipment including some much better rotating pens.

An important religious consideration is also muddled on this page. The Jewish community requires that the animal be conscious at the time of slaughter. The Muslim community requires proof that the animal is alive at the time of slaughter. How one determines this with 100% certainty on any stunned animal is the question that needs to be addressed before many Muslims are prepared to accept stunned slaughter – demonstrations involving a few animals are insufficient. This must be determinable for all animals under all circumstances.

Page 14. Religious slaughter requires a continuous cut. The number of cuts is an area that needs to be minimized. The EBLEX (2009) DVD shows the cutting of lambs being done with a single aggressive cut. In plants where this is not occurring, further training of slaughtermen may be necessary. And if the actual cut is incomplete, that again reflects a need for additional training.

Page 15. The animals were “driven” to the restrainer. How calmly was this done? Who actually did the slaughter? What was his/her training? What knife was used? How was sharpness determined? The restrainer is also not described nor is the head holder. The time between stunning and neck cut were not estimated. Again the total absence of information about a number of very critical parameters makes it difficult to judge the relevance of the work.

A very specific “correlation dimension” value is given citing the original work. But how widely is such a measurement accepted. They provide no other references to that method. On the next page they present a measurement “% Power”, which I believe is undefined. Given the lack of critical methodological details and what appear to be carefully selected parameters, I remain skeptical of the relevance of the results.

Page 22. The higher heart rate after the “driving” suggests that this may have been more stressful than necessary. If a proper chute system were used might these numbers be lower and again impact the interpretation of the data? And the electrical stunning seemed to increase the heart rate – does that suggest that electrical stunning might actually not be a good method to use? So is higher heart rate good or bad?

Page 24. Discussion. The first paragraph brings up the legal requirement of “non-aversive” if unconsciousness is not immediate. That is the critical point and is not discussed or actually recognized and is ignored for gas stunning/killing. It contradicts the emphasis on time as the critical variable. Thus, Temple Grandin’s statement on observing religious slaughter remains a valid and important observation, i.e., that the animal is becoming unconscious without aversive reactions.

The statement “Assessment of neural and physiological parameters may elucidate the humaneness of the stunning and killing procedure” is very unconvincing. It suggests that some of the measurements may not measure the parameters of interest for making such a determination. Shortly thereafter the following statement has the added complication of bringing in “suffering”, which is neither actually ever addressed nor defined critically: “used to assess the effectiveness of mechanical and electrical head-only stun duration on welfare and the effect on pain sensation and suffering...”

In the next paragraph there is the statement: “...slow induction of unconsciousness after neck cutting and a possible pain sensation during neck cutting.” But again notice the word “possible”. So again the evidence to establish those relationships seems to be missing. A definition of unconsciousness is given that again fails to distinguish between “unconsciousness” and “insensibility”.

The high level of aneurysms suggests that the person doing the cutting needs some training.

Page 25. The high level of vocalization again suggests that these investigators had significant problems with their system. So again, how valuable is any data reported?

Page 26. Conclusions. After making a big deal about the negative impact of turning 180 degrees, the authors conclude that other degrees of turning, including 90 degrees, do not make any difference. They then allow 80 seconds for unconsciousness (undefined) without establishing any basis for such a recommendation

The final conclusion clearly was the goal of the work, i.e., to recommend stunning. So regardless of the outcome or the meaningfulness of the work, this conclusion had to be established. It, however, is not credible after a careful reading and evaluation of the paper. Overall this paper is far from addressing any significant aspects of the religious slaughter itself, i.e., the issue of stunned versus un-stunned slaughter.

Appendix VI

Labeling

This is one of those issues that is often brought up in these discussions, including professional/scientific discussions – under the guise of providing consumers with necessary information. It also is the subject of EU legislation so it is relevant to Holland. Who are the consumers that really want this information? What is the real goal of such discussions? And what are the consequences? The discussion to date suggests that it is a deliberate attempt to convince consumers not to buy the meat – if it has a yellow star or a minaret on the meat. If the aim is to provide important consumer information and be consistent for all options, it might be suggested that the following set of statements be mandated for meat:

- i. By Smashing the Animal over the Head to Crack its Skull (being banned in the EU)
- ii. By Smashing Through the Skull
- iii. By Electrocuting the Animal
- iv. By Using a Gas Chamber
- v. By a bullet to somewhere in the animal and after many minutes of running in the wild in panic the animal finally collapsed
- vi. By hunting with a “bullet” or a “bow”.
- vii. Traditionally Hand Slaughtered with Respect for the Animal.

So if we are to have slaughter labeling, let’s talk about all our killing – of how all animals are killed and possibly of how all plants are killed. (Why are we so anthropomorphically focused on higher animals?) The consumer has a right to know it all and to pay for the various choices and pick up the cost of both segregating meat from each type of slaughter and providing the information to consumers. Is that really a desirable goal?

Labeling meat that is not marketed to the religious communities and is not presented to consumers as meeting those needs, as long as it has been slaughtered with appropriate animal welfare protection, is unethical, because it puts the government requiring such labeling in the position of promoting anti-religious views among those who are not religious, which in itself is a form of promotion of a religious equivalent. The cost of enforcing any new labeling provisions for both the industry and the government are issues that also ought to be addressed.

If precautions need to be taken to foster more humane slaughter, then some kinds of regulations should be enforced at the place and time of slaughter to minimize inhumane kills, but these regulations and enforcement issues would not necessarily involve labeling of meat.

Appendix VII

Statement of the Royal Dutch Association of Veterinarians (KNMvD)

The premise that doing religious slaughter is slower is not relevant to a discussion of humane slaughter and, possibly more difficult to do right, does not preclude it from actually being done right. The possible need to upgrade equipment is also real, but that again does not support the need to ban un-stunned religious slaughter. Dealing with the worst case scenario for unconsciousness is an issue that has already been dealt with. The key is that for cattle, which are the hardest animal to slaughter, the time is 10 to 33 seconds with an average of about 17 seconds for a good system (Dr. Grandin, personal communication) and which is then what religious slaughter plants ought to be expected to meet.

Many of the other issues remain unproven postulates and have also been discussed elsewhere. So this statement is based on the same inappropriate research as has been already evaluated and discussed in detail elsewhere in this report.

Appendix VIII

An Update on the Rabbinical Assembly Responsa

From the Party for Animals (05/13/11)

...

We think it right to inform you that we never suggested such support - nor did we ask for it. We do indeed sometimes refer to the report 'A stunning matter', http://www.rabbinicalassembly.org/sites/default/files/public/halakhah/teshuvot/19912000/rabinowitz_stunning.pdf, to illustrate the fact that there is more than one opinion within the Jewish world on using stunning or bolting – and that using stunning or bolting under certain conditions is allowed, according to the Rabbinical Assembly. To be completely sure we interpret the report correctly, we contacted Rabbi Mayer Rabinowitz. He assured us the paper permits pre shitah stunning as well as post shitah stunning and bolting.

...

Yours sincerely,
Xandra van den Bleek
Civil Secretary
Party for the Animals

And the response from Mayer Rabinowitz, the author of the responsa (05/13/11)

I didn't say that I permit pre-slaughter stunning and told them to read the paper. I mention that pre-slaughter stunning was permitted by some. In the conclusion I didn't mention pre-slaughter stunning at all. The paper used the position of pre stunning mentioned and said that if some permitted pre stunning how much the more so post slaughter stunning would be permitted. The RA issued a statement which I saw yesterday for the first time. It correctly clarifies the position mentioned above.

Appendix IX

Recommended Animal Handling Guidelines & Audit Guide: A Systematic Approach to Animal Welfare; June 2010 Edition;

Published by American Meat Institute

Written by

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With the American Meat Institute Animal Welfare Committee

Section 5: Religious Slaughter (Kosher and Halal)

Cattle, calves, sheep or other animals that are ritually slaughtered without prior stunning should be restrained in a comfortable upright position. For both humane and safety reasons, plants should install modern upright restraining equipment whenever possible. Shackling and hoisting, shackling and dragging, trip floor boxes and leg clamping boxes should never be used. In a very limited number of glatt Kosher plants in the United States and more commonly in South America and Europe, restrainers that position animals on their backs are used. For information about these systems and evaluating animal welfare, refer to www.grandin.com (Ritual Slaughter Section).

The throat cut should be made immediately after the head is restrained (within 10 seconds). Small animals such as sheep and goats can be held manually by a person during ritual slaughter. Plants that conduct ritual slaughter should use the same scoring procedures except for stunning scoring, which should be omitted in plants that conduct ritual slaughter without stunning.

Cattle vocalization percentages should be five percent or less of the cattle in the crowd pen, lead up chute and restraint device. A slightly higher vocalization percentage is acceptable because the animal must be held longer in the restraint device compared to conventional slaughter. A five percent or less vocalization score can be reasonably achieved. Scoring criteria for electric prod use and slipping on the floor should be the same as for conventional slaughter.

Animals must be completely insensible before any other slaughter procedure is performed (shackling, hoisting, cutting, etc.) If the animal does not become insensible, it should be stunned with a captive bolt gun or other apparatus and designated as non-Kosher or non-Halal.

Preliminary Report: Regenstein, Cornell, May 23, 2011

ASPCA Pen— This device consists of a narrow stall with an opening in the front for the animal’s head. After the animal enters the box, it is nudged forward with a pusher gate and a belly lift comes up under the brisket. The head is restrained by a chin lift that holds it still for the throat cut. Vertical travel of the belly lift should be restricted to 28 inches (71.1 cm), so that it does not lift the animal off the floor. The rear pusher gate should be equipped with either a separate pressure regulator or special pilot-operated check valves to allow the operator to control the amount of pressure exerted on the animal.

Pilot operated check valves enable the operator to stop the air cylinders that control the apparatus at mid-stroke positions. The pen should be operated from the rear toward the front. Head restraint is the last step. The operator should avoid sudden jerking of the controls. Many cattle will stand still if the box is slowly closed up around them and less pressure will be required to hold them. Ritual slaughter should be performed immediately after the head is restrained (**within 10 seconds of restraint**) .

An ASPCA pen can be easily installed in one weekend with minimum disruption of plant operations. It has a maximum capacity of 100 cattle per hour and it works best at 75 head per hour **or less**. A small version of this pen could be easily built for calf plants.

Conveyor Restrainer Systems—Either V restrainer or center track restrainer systems can be used for holding cattle, sheep or calves in an upright position during shehita or Halal slaughter. The restrainer is stopped for each animal and a head holder positions the head for the ritual slaughter official. For cattle, a head holder similar to the front of the ASPCA pen can be used on the center track conveyor restrainer. A bi-parting chin lift is attached to two horizontal sliding doors.

Small Restrainer Systems—For small locker plants that ritually slaughter a few calves or sheep per week, an inexpensive rack constructed from pipe can be used to hold the animal in a manner similar to the center track restrainer. Animals must be allowed to bleed out and become completely insensible before any other slaughter procedure is performed (shackling, hoisting, cutting, etc.).

Audit form for Cattle

**Recommended Animal Handling Guidelines and Audit Guide 2007 Edition
CATTLE AND CALVES SLAUGHTER AUDIT FORM**

Date: _____ Time: _____
Plant: _____ Auditor: _____
Weather: _____ Line Speed: _____
Stunner Type: _____ Operator: _____
Plant Contact Name: _____ Phone: _____
Email: _____ Establishment No.: _____

CORE CRITERIA 1: EFFECTIVE STUNNING — Conventional Only

Score 100 cattle in plants with line speeds greater than 100 cattle per hour. Fifty cattle should be audited in slower plants processing fewer than 100 head per hour. Ninety-five percent accuracy is required for a passing score. If audit is conducted in a religious slaughter facility, skip to Core Criteria 2.

It can be helpful to note observations about missed stuns using the following guide:

X = stunned correctly

G = stunning failed due to apparent lack of maintenance

A = missed stun due to poor aim

Animal Number:

1	11	21	31	41	51	61	71	81	91	
2	12	22	32	42	52	62	72	82	92	
3	13	23	33	43	53	63	73	83	93	
4	14	24	34	44	54	64	74	84	94	
5	15	25	35	45	55	65	75	85	95	
6	16	26	36	46	56	66	76	86	96	
7	17	27	37	47	57	67	77	87	97	
8	18	28	38	48	58	68	78	88	98	
9	19	29	39	49	59	69	79	89	99	
10	20	30	40	50	60	70	80	90	100	

Stun Efficacy Percent _____

Notes:

CORE CRITERIA 2: BLEED RAIL INSENSIBILITY — Conventional and Religious

Any sensible animal on the bleed rail constitutes an automatic audit failure. It is CRITICAL that animals showing signs of a return to sensibility be restunned immediately. There is “zero tolerance” for beginning any procedures like skinning the head or leg removal on any animal that shows signs of a return to sensibility. However, it is important to complete the audit and note observations about insensibility using the following guide:

X = completely insensible; no signs of return to sensibility

E = eyes moved when touched

BL = blinking

RB = rhythmic breathing

VO = vocalization

RR = righting reflex/animal attempts to lift head

Note signs of sensibility observed by animal number:

1	11	21	31	41	51	61	71	81	91	
2	12	22	32	42	52	62	72	82	92	
3	13	23	33	43	53	63	73	83	93	
4	14	24	34	44	54	64	74	84	94	
5	15	25	35	45	55	65	75	85	95	
6	16	26	36	46	56	66	76	86	96	
7	17	27	37	47	57	67	77	87	97	
8	18	28	38	48	58	68	78	88	98	
9	19	29	39	49	59	69	79	89	99	
10	20	30	40	50	60	70	80	90	100	

Percent Insensible _____

Notes:

CORE CRITERIA 3: SLIPS AND FALLS — Conventional and Religious

3A: Count the number of cattle that slip or fall during unloading. In large plants where multiple vehicles are continuously unloaded, 100 cattle from three different vehicles are scored. For all species, an equal number of animals from each deck should be scored. Vehicles should be scored in the order of arrival at the unloading ramp. In small plants where vehicles are not continuously unloaded, a single vehicle should be scored. If no vehicle arrives, the scoresheet is marked “unloading not observed.”

X = no slipping or falling F = fell S = slipped

1	_____	11	_____	21	_____	31	_____	41	_____	51	_____	61	_____	71	_____	81	_____	91	_____
2	_____	12	_____	22	_____	32	_____	42	_____	52	_____	62	_____	72	_____	82	_____	92	_____
3	_____	13	_____	23	_____	33	_____	43	_____	53	_____	63	_____	73	_____	83	_____	93	_____
4	_____	14	_____	24	_____	34	_____	44	_____	54	_____	64	_____	74	_____	84	_____	94	_____
5	_____	15	_____	25	_____	35	_____	45	_____	55	_____	65	_____	75	_____	85	_____	95	_____
6	_____	16	_____	26	_____	36	_____	46	_____	56	_____	66	_____	76	_____	86	_____	96	_____
7	_____	17	_____	27	_____	37	_____	47	_____	57	_____	67	_____	77	_____	87	_____	97	_____
8	_____	18	_____	28	_____	38	_____	48	_____	58	_____	68	_____	78	_____	88	_____	98	_____
9	_____	19	_____	29	_____	39	_____	49	_____	59	_____	69	_____	79	_____	89	_____	99	_____
10	_____	20	_____	30	_____	40	_____	50	_____	60	_____	70	_____	80	_____	90	_____	100	_____

Percent falling _____ Percent slipping _____

Note where slipping/falling occurred:

Notes:

Preliminary Report: Regenstein, Cornell, May 23, 2011

3B: Count the number of cattle that 1) slip and 2) fall during handling in any of the following locations: crowd pen, single file chute, barns, alleys or stunning box. A slip is recorded when a knee or hock touches the floor. In cattle stun boxes and the single file chute, a slip should be recorded if the animal becomes agitated due to multiple short slips. A fall is recorded if the body touches the floor. One percent or fewer falls and three percent or fewer slips are required for a passing score.

X = no slipping or falling F = fell S = slipped

1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	20	30	40	50	60	70	80	90	100

Percent falling _____ Percent slipping _____

Note where slipping/falling occurred:

Notes:

CORE CRITERIA 4: VOCALIZATION — Conventional and Religious

Monitor the number of cattle that vocalize (provoked by stress or agitation) in the crowd pen, lead-up chute stunning box or restrainer. Vocalizing animals in the crowd-pen and lead up chute are scored during active handling. Score an animal as a vocalizer if it makes any audible vocalization. Three percent or less of cattle should moo or bellow. In Kosher or Halal operations or any operation using a head holder, up to five percent vocalization is acceptable for a passing score. It is helpful to note the possible cause of vocalization using the codes below:

X = non-vocalizer P = prod

S = stun F = fell or slipped

U = unknown cause R = restrainer

M = missed stuns SE = sharp edges

UN = unprovoked

1	11	21	31	41	51	61	71	81	91	
2	12	22	32	42	52	62	72	82	92	
3	13	23	33	43	53	63	73	83	93	
4	14	24	34	44	54	64	74	84	94	
5	15	25	35	45	55	65	75	85	95	
6	16	26	36	46	56	66	76	86	96	
7	17	27	37	47	57	67	77	87	97	
8	18	28	38	48	58	68	78	88	98	
9	19	29	39	49	59	69	79	89	99	
10	20	30	40	50	60	70	80	90	100	

Percent vocalizing: _____ Percent vocalizing: _____

Notes:

CORE CRITERIA 5: PROD USE — Conventional and Religious

Monitor the percentage of 100 cattle prodded with an electric prod at the restrainer entrance. Twenty-five percent or fewer cattle should be prodded for passing score. If multiple employees use prods, score 100 animals passing by each employee. Add the percentages together to determine final score. Note whether or not a prod was used for each animal and the apparent reason for prod use:

X = moved quietly without an electric prod

P = electric prod used without apparent reason

B = electric prodded in response to balking

1	11	21	31	41	51	61	71	81	91	
2	12	22	32	42	52	62	72	82	92	
3	13	23	33	43	53	63	73	83	93	
4	14	24	34	44	54	64	74	84	94	
5	15	25	35	45	55	65	75	85	95	
6	16	26	36	46	56	66	76	86	96	
7	17	27	37	47	57	67	77	87	97	
8	18	28	38	48	58	68	78	88	98	
9	19	29	39	49	59	69	79	89	99	
10	20	30	40	50	60	70	80	90	100	

Percent prodded _____

Percent balking _____

Notes:

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CORE CRITERIA 6: WILLFUL ACTS OF ABUSE — Conventional and Religious

Any willful act of abuse is grounds for automatic audit failure. Willful acts of abuse include but are not limited to: 1) dragging a conscious, non-ambulatory animal; 2) intentionally applying prods to sensitive parts of the animal like the eyes, ears, nose or rectum; 3) deliberate slamming of gates on livestock; 4) purposeful driving of livestock on top of one another; 5) hitting/beating an animal. Note any such acts observed.

Were any willful acts of abuse observed?

Yes ____ No ____

If yes, detail incident(s) below:

Notes:

CORE CRITERIA 7: ACCESS TO WATER — Conventional and Religious

Observe access to water. Do animals in all pens have access to clean drinking water?

Yes ____ No ____

Notes:

Final Scoring – Cattle and Calves Audit

Core Criteria Passing Score Actual Score

Core Criteria 1: Effective Stunning 95% or greater accuracy _____

Core Criteria 2: Bleed Rail Insensibility 100% insensible _____

Core Criteria 3: Slips and Falls

3A: Truck Unload 1% or less falls _____

3% or less slips _____

3B: In Plant 1% or less falls _____

3% or less slips _____

Core Criteria 4: Vocalization 3% or less _____

5% or less with head-holder/ritual _____

Core Criteria 5: Prod Use 25% or less prodded _____

Core Criteria 6: Willful Acts of Abuse No willful acts of abuse _____

Core Criteria 7: Access to Water Yes – water provided _____

Plant passed all numerically scored criteria? Yes ____ No ____

Auditor signature

Date

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SECONDARY AUDIT ITEMS

These items may be helpful in gathering general information about a facility. However, because they involve a high degree of subjectivity and because they are almost impossible to score objectively, they should not be used in determining whether a facility passes or fails an audit.

1. Does the facility have a documented training program for its employees or use an outside training program to teach the principles of good animal handling?

Yes ____ No ____

2. Does the facility have a protocol that is written or widely understood for handling non-ambulatory animals?

Yes ____ No ____

3. Are facility personnel trained in handling non-ambulatory animals?

Yes ____ No ____

4. Do they inspect the facility weekly and document for repair any damage or sharp protrusions that may injure animals?

Yes ____ No ____

5. Does the facility provide special training to stunner operators to ensure proper equipment use and stunning efficacy?

Yes ____ No ____

6. Does the facility have a protocol for stunning equipment maintenance?

Yes ____ No ____

7. Does the facility train its personnel and have a written procedure or protocol about how to handle a sensible animal on the bleed rail?

Yes ____ No ____

8. Is non-slip flooring provided throughout the facility?

Yes ____ No ____10

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Preliminary Report: Regenstein, Cornell, May 23, 2011

9. Are non-electrical devices the primary tool used to move livestock?

Yes ____ No ____

10. Do crowd pens generally appear to be less than 75 percent full?

Yes ____ No ____

11. Are animals unloaded from trucks promptly (target is within one hour of delivery)?

Yes ____ No ____

12. If mounting behaviors were observed, are animals that chronically mount removed from the pen?

Yes ____ No ____ NA ____

13. Does the company perform internal audits at least weekly?

Yes ____ No ____

14. Does the company have an emergency management plan for livestock on file?

Yes ____ No ____

Notes related to secondary audit items:

Appendix X

Notes on Stunning and BSE

The US Department of Agriculture (USDA) has announced that amongst new regulations to prevent the spread of BSE - "Mad Cow Disease" - the use of the pneumatically charged captive-bolt stun gun, which pneumatically piths the animal, is now forbidden, since this can transmit the infection beyond the brain and spinal column. A study (known as the Harvard Study) has found that when air-injection pneumatic stunners are used, CNS (central nervous system) tissue emboli can be identified visually in the pulmonary artery and in the right ventricle of the heart and microscopically in the jugular venous blood. The US Food Safety and Inspection Service (FSIS) is amending the Federal meat inspection regulations to prohibit the use of these types of penetrative captive bolt stunning devices. The Harvard study estimates that for each BSE-infected animal stunned with a standard captive bolt stunner (without air injection) there is a 50 percent probability that a very small fraction of the brain tissue (possibly with the BSE-prion) will be transferred to the blood. Pneumatic type captive bolt stunners have a 31% probability that the brain tissue (with the BSE-prion) is transferred to the blood, heart, lung and liver.

Religious slaughter avoids the above risk by avoiding disturbing the brain.
(Based on the Federal Register, Feb. 14, 2010.)s