Animal Welfare

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THE HISTORY OF ANIMAL WELFARE IN ISLAM

Animal welfare is by no means a new issue in the production of halal foods. The welfare of animals has been a fixture of the Islamic view on the raising and slaughter of animals since the time of Prophet Muhammad (PBUH). In recent years, the slaughter of animals in keeping with religious principle has become a contentious point of political and scientific debate. This debate stems largely from a misunderstanding outside of the halal slaughter industry as to the goals of halal slaughter and a lack of vigilance within the industry to strive for better animal welfare. There are many verses in the Quran and teachings in the Hadiths that establish the importance of animal welfare in a true Islamic system of agricultural production. It is important when looking at animal welfare from an Islamic perspective not to focus just on the end of an animal’s life but to consider the whole life of the animal up to and including its demise (Department of Standards Malaysia, 2009).

This first section will use a few religious quotes to establish the importance of animal welfare in Islam. The overarching themes within early Islamic teachings as they apply to animal welfare are twofold: Animals are individuals that experience life in a way parallel to those of humans, and thus deserve parallel consideration. However, humans were given a greater gift of cognitive understanding than animals, which gives us certain rights and responsibilities over animals and most particularly over the ones that contribute to our food supply.
The Quran established in the following verse the moral importance of animals.

There is not an animal (that lives) on the earth, nor a being that flies on its wings, but (forms part of) communities like you. Nothing have we omitted from the Book, and they (all) shall be gathered to their Lord in the end.

Sura 6 Ayat 38

By stating that all animals are part of communities and that all will be equally gathered to God at the time of judgment, the verse suggests that any act for or against an animal is equivalent to an act for or against a fellow human. If this line of thinking were left to continue unchecked it would lead to a vegetarian lifestyle. As a result, the Quran gave specific instructions as to what would make an animal unacceptable to eat.

Say,

I do not find within that which was revealed to me [anything] forbidden to one who would eat it unless it be a dead animal or blood spilled out or the flesh of swine – for indeed, it is impure – or it be [that slaughtered in] disobedience, dedicated to other than Allah. But whoever is forced [by necessity], neither desiring [it] nor transgressing [its limit], then indeed, your Lord is Forgiving and Merciful.

Sura 6 Ayat 145

To these simple instructions relating to the moral value of animals and the allowance for humans to eat them, one can add the teachings of the Hadiths. Below are three Hadiths that very clearly show that any form of cruelty, be they either from neglect, misapplication of a husbandry procedure, or aversive training techniques are counter to the teachings of Islam.

Jabir, may God be please with him, reported: The Prophet (PBUH) passed by an animal that had been branded upon its face. The Prophet (PBUH) said, “Allah has cursed whoever does this. Let not one of you mark the face or strike it.”

Sahih Muslim

Ibn Umar, may God be pleased with them, reported: The Messenger of Allah (PBUH) said, “A woman was punished because of a cat she had imprisoned until it died; thus, she entered Hellfire because of it. She did not give it food or water while it was imprisoned, neither did she set it free to eat from the vermin of the earth.”

Sahih Muslim

Aisha, may God be pleased with her, reported: I was upon a camel which was misbehaving so I began to strike it, then the Messenger of God (PBUH) said to me, “You must be gentle, for verily, gentleness is not in anything except that it beautifies it, and it is not removed from anything except that it disgraces it.”

Sahih Muslim

To the above teachings about the treatment of animals during their lifetime one can add the following Hadith on slaughter to complete the picture of how animals
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should be treated by humans. These teachings make it clear that slaughter may only happen for a valid reason and, even then, it should not be taken lightly.

On the authority of Abu Ya’laaShaddaad bin Aws, may God be pleased with him, reported that the Messenger of God (PBUH) said:

Verily God has prescribed Ihsaan (proficiency, perfection) in all things. So if you kill then kill well; and if you slaughter, then slaughter well. Let each one of you sharpen his blade and let him spare suffering to the animal he slaughters.

Sahih Muslim

Sharid reported: I heard the Messenger of Allah (PBUH) say, “Whoever kills so much as a sparrow for no reason will have it pleading to Allah on the Day of Resurrection, saying: O Lord, so-and-so killed me for no reason, and he did not kill me for any beneficial purpose.”

Sunan An-Nasa’i

This section has illustrated that animal welfare was an early and prominent concern in Islam. The question remains: How can a moral system from the time of Muhammad (PBUH) be acted upon in a modern agricultural system? Even this question has a simple answer in Islamic teaching.

From Abi Abdillah(as), he said: “Seeking knowledge is an obligation in all cases (under all circumstances).”

Bihar Anwar

In the spirit of seeking knowledge, the next section has a brief summary of recent developments in animal welfare from a modern scientific perspective.

THE SCIENCE OF ANIMAL WELFARE

The foundation of the modern science of animal welfare was not one event or dependent on one person but the result of the confluence of empathy and scientific reasoning. The most defining moments in the modern science of animal welfare was the result of public pressure on the industry to make changes (Kannan et al., 2003). In 1965, a committee was formed to address animal welfare in the United Kingdom. The Bramble Committee Report listed certain freedoms that all animals should be given. These freedoms have been solidified in the modern concept of the Five Freedoms, which are listed below:

Freedom from thirst and hunger: Have ready access to fresh water and a diet to maintain full health and vigor.

Freedom from discomfort: Be provided an appropriate environment including shelter and a comfortable resting area.

Freedom from pain, injury, and disease: By prevention or rapid diagnosis and treatment.
Freedom to express most normal behaviors: By providing sufficient space, proper facilities, and the company of the animal’s own kind.

Freedom from fear and distress: By ensuring conditions and treatment which avoid mental suffering.

These freedoms set the stage for how scientific researchers have approached animal welfare. One of the most difficult aspects of ensuring good animal welfare is determining the true needs and preferences of animals without being anthropomorphic. An example of the conflict between science and human perception is the temperature at which dairy cattle prefer to be kept. Based on human preference, there was a time where dairy cattle were kept in poorly ventilated warm barns because from a human perspective these were the most comfortable, but science has shown that cattle feel the effects of heat stress at much lower temperatures than humans leading to their being most comfortable between 55°F and 65°F. Because it is difficult to measure an animal’s mental state, medical and production metrics have served as the primary indicators of “good” animal welfare. However, research has shown that while bad animal welfare often negatively impacts health and production, these effects can be masked by intensive breeding programs and medical advances. Recent studies have helped to determine an animal’s preferences and mental state by using carefully controlled preference test studies where an animal is asked to work to achieve a desired goal and how strongly they are willing to work for this goal is taken as a measure of their need, that is, the harder they are willing to work for something, the more important it is to the ANIMAL. Careful behavioral observations of abnormal behaviors and of animal interactions are also being used to evaluate the animal welfare status of a particular set of conditions (Nakyinsige et al., 2012).

Recent work has begun to conceptualize the idea of “coping” as a measure of animal welfare. At very low stress, an animal may actually be bored and show unacceptable behaviors, often referred to as stereotypies. So work is focused on “environmental enrichment.” In the general “coping” range, which includes some stress, the animal thrives. Real life is not stress-free! When the stress becomes excessive, the animal becomes subject to disease and even death (Micera et al., 2010).

The above scientific findings support the Islamic philosophy that animals are a part of communities that are parallel to, but not always the same as, human communities. Science has shown that animals are able to feel pain and to remember positive and negative interactions with each other, with humans, and with different environments (Casoli et al., 2005). Modern animal welfare has accepted a set of principles that are easily embraced by an Islamic ethos.

CONTEMPORARY ISSUES IN ANIMAL WELFARE

The modern halal animal production systems cannot rely entirely on historic Islamic teachings to explain what is right and wrong in a modern setting. As the number of people and domesticated animals in the world has increased so have the pressures on agricultural systems. It seems clear from the Islamic teaching discussed previously that any halal production system should take into account the mental and physical state of the animals in that system. Many of the teachings of Islam have been
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reinforced by science so when there is no clear Islamic ruling on how to resolve an issue, a logical way of dealing with the issue would seem to be to use scientific reasoning and information guided by an Islamic moral compass.

The following sections will deal with a few of the major animal welfare issues that modern agriculture is facing. Not all of the difficulties discussed in the following sections have clear solutions. The mental state of animals is not entirely understood and, thus, its impact on the animal’s welfare needs further research. And the need to provide for global food security along with other unintentional consequences of such changes must be carefully weighed against the potential benefit of any change based on welfare considerations. This is not to imply that humans should not make any sacrifices for animal welfare, it is only meant to emphasize that a clear benefit to animals should be demonstrated before changes are made, including addressing other critical issues such as global food security, environmental sustainability, human health and safety, worker health and safety, and the impact on price/affordability. These are all issues that need to be balanced. Because Muslims expect good animal welfare, it is important to discuss these issues so that animal products for the Muslim community are not only halal, but also meet the full range of tayyab and animal welfare standards.

HOUSING

In the time of Prophet Mohammad (PBUH), the primary housing concerns of animal caregivers was how to provide safety from predators for their stock. This was, and often is still, done using dogs and other guard animals to supplement humane watchfulness. Humans were not always successful in their efforts to keep their stock safe but animal welfare is straightforward when it comes to predation. Caregivers either succeed in preventing predation, or fail and animals get injured or killed. The only welfare concern that cannot be immediately addressed by traditional caregivers is if the stock fears predation. Fear is a negative welfare state that can best be prevented by preventing fear inducing circumstances. The animal that is attacked by a predator is in an obvious negative welfare state, but all the animals that can observe the attack may also be in a negative welfare state of fear if they are able to process the information. Thus, outdoor housing systems such as free-range, pasture, and rangeland agricultural systems continue to face this challenge. In the western United States, flocks of sheep historically suffered up to 10% annual loss due to predation, chiefly by coyotes. This is an example of a traditional animal rearing system, range grazing, which can lead to a negative welfare state due to predation and the fear of predation, yet is often the preferred method for raising animals according to many consumers. This percentage has been reduced greatly by the use of guard dogs and other guard animals such as llamas, but it remains an animal welfare concern.

Once animals are brought into confined systems, either fenced pastures or barns, the risk of predation is greatly reduced, as is presumably the associated fear, but other concerns arise. Decreases in space can lead to increased disease, decreased natural movement, and the challenges of adapting to new types of flooring among other issues. The need to have more animals to feed the world’s population means that animals began to be kept in closer proximity to their owners through the use of
pastures. When animals are confined and can no longer find natural shelter, man-made shelters must be provided for them. These can be temperature controlled for the animals’ comfort regardless of what is happening outdoors. But this all has led to an increase in animal interactions that can facilitate the spread of disease. Better methods of disease control such as, but not limited to, modern antibiotics have eliminated many of these problems but others still remain. With the recent emphasis on the reduction of antibiotic use, animal agriculture is looking at greater use of prebiotics and pro-biotics along with other dietary interventions. Preliminary results suggest that some of these interventions can be successfully used to decrease antibiotic use. On the other hand, the total absence of antibiotic use can lead to situations where a farmer fears the loss of the economic value of his animals and if he does not use antibiotics quickly or completely enough, this leads to undue animal pain and possible deaths. The use of production systems that mandate the absence of antibiotics can therefore lead to poorer animal welfare.

One of the ways that barns have changed to allow for better disease control is to replace dirt floors with other more easily cleaned floors. Often these floors can be slippery, which can cause injury or are unforgiving in ways that can cause lameness. However, with a small investment, the farmer can address this problem. Increased pressures on land use have led to even higher stocking densities in pastures and confinement systems. Some confinement systems, such as those for chickens, have reached stocking densities where there is no longer enough space for animals to perform their full range of movements, but the importance of each of these movements has not always been ascertained. The question that remains for animal agriculture is: How much space and what kind of space do animals need to enjoy a healthy mental state and physical well-being, that is, an ability to cope on an on-going basis?

Making changes in stocking density is not something that can happen overnight without gravely endangering the food supply. Also, given that animal welfare is a relatively young discipline in comparison to the domestication of animals, what steps need to be taken to correct housing problems are not always clear. Many of the housing choices that have led to confinement agriculture were made with the intention of ensuring animal health and safety. Further changes in housing should be made based on scientific research as to what is best for the animals with careful attention to any unintended side effects.

FEEDING

The feeding of animals can be a welfare concern in many different ways. Animals can be given too much food, not enough food, or the wrong kind of food. The welfare issues associated with too much food tend to be more noticeable and show animals where human anthropomorphic behavior negatively impacting the animals is more common, and thus, are rarely a concern in a production setting. Too little food can be a problem for livestock in two ways. First and simply, too little volume of food is a welfare concern. The second way an animal can be starved is less obvious. If a grazing animal is provided with very low quality forage, it is possible that they are prevented from eating enough digestible nutrition even when overfilling their gut. To prevent these problems, animals must be provided with sufficient volume and quality
of forage to provide for their nutritional needs or forage should be supplemented during times when the quality is not nutritionally sufficient. It is important that any hay or silage that is produced from forage must be harvested at such a time so that the resulting product provides proper animal nutrition (Gregory et al., 2010).

Another way that feed may become an animal welfare problem is in feeding feeds with the wrong nutritional balance. This can lead to animals with skeletal abnormalities if the wrong balance of minerals is given, growth rates that are not structurally supported if too many carbohydrates are given, or animals with too many hazardous metabolic byproducts in their system when they are fed the wrong foods to maintain high levels of production. This last problem is the most difficult to control in the agriculture industry, because it can be the result of pushing for the best possible production from an animal. Another issue is that feeds may become spoiled. Some of these spoiled feeds are simply devoid of the proper nutrients but in other cases they may be toxic to the animals.

Finding solutions to animal welfare problems associated with feeding is one of the simplest areas of welfare to address but also one of the most complex. It is fairly simple to analyze feed and formulate diets based on an animal’s need. However, how is an animal to be fed when the choices are to feed too little for its production requirements or to feed it high calorie feed that could adversely affect its metabolic function? The answer to this question lies with finding a solution to another animal welfare problem, breeding solely for production traits.

An aspect of importance to Muslims is the use of feed that contains najis (filth). This is discussed separately in more detail in Chapter 21.

**BREEDING**

Farm animal breeding has focused on production traits for many years. The modern dairy cow is an excellent example of both the negatives and positives that can be achieved via breeding programs. In 1910, the average United States dairy cow produced 1320 kg (2910lb) of milk per year, by 2011 that number had climbed to 10,600 kg (23,300 lb) for the Holstein breed. By any definition, this is a major accomplishment of breeding, but that is only part of the story. The higher production rates have come at the cost of shorter productive life spans, lower reproductive efficiency, and much higher nutrient requirements. As the negative effects of selective breeding tend to become known more slowly and are often much harder to measure than production traits, this can receive too little focus within the agricultural industry. Genetic traits that cause poor animal welfare often get ignored because there is little that the management of a facility can do to improve welfare and the feedback to the breeders is inefficient. An example of this is some broiler chickens that have difficulty moving freely close to the time of slaughter. There is little that a farmer can do to prevent a problem that is caused by extremely rapid and profitable growth rates for these birds that the farmer obtains as one-day-old chicks from the breeders. Production farms and breeding farms must communicate and work better together to breed birds that are physically robust up through the time of slaughter. The use of modern computers and big data sets has allowed the breeding industry, under pressure, to improve animal welfare by beginning to address some of these problems.
The most logical solution to animal welfare problems that have been bred into production animals would be to allow for genetic production to plateau or improve slowly for the time being while addressing animal welfare problems as part of the breeding program without having to reduce production traits. This would mean selecting animals based on a “whole health” basis. This would allow production to be kept at current levels while breeding out negative traits. Some traits that should receive such attention would be skeletal abnormalities in broiler chickens, osteoporosis in laying hens, reproductive failure, lameness, and metabolic illness in dairy cattle, and parasite tolerance in small ruminants. Both good health traits and animals that are temperamentally well suited for the production system being use should be considered in breeding programs.

**BIOSECURITY**

The concept of biosecurity is a new concern in comparison to the history of animal welfare in Islam. But there is no question that the increased pressure on the global ecosystem and increased ease of travel has made biosecurity a significant concern for animal welfare, and for both human and animal health. The absence of a sound biosecurity system will lead to poorer animal welfare.

The prevention of disease has been one of the primary motivators of confinement agriculture. Confinement allows the persons caring for the animals to inspect them with greater frequency and for one group of animals to be kept physically separate from the diseases of other groups of animals. This is most notably the motivation for keeping chickens in enclosed barns. Chickens that are kept outside are not only at risk for predation but also at risk from diseases spread by wild birds, rodents, and insects. There is currently no practical method for preventing fecal contamination and disease transmission from wild birds to domestic fowl housed in an open air environment. Biosecurity must be considered when any husbandry changes designed to improve animal welfare are considered.

The other areas where biosecurity concerns create animal welfare concerns are in animal transport and human interactions with animals. The transport of animals for long distances allows for widespread disease transmission if proper precautions are not in place. This includes waste management during transport and bio-secure resting places for animals traveling longer distances. Animals being transported long distances should be off-loaded at rest stops to drink and eat as they often will not, or cannot, engage in those activities during transport. In some cases, the rest can be on the transport vehicle, but at other times, offloading may be necessary. Transport welfare will be touched on further in the next section.

Human interaction becomes an issue when people interact with one group of animals and then travel to visit another group. This allows humans to act as vectors for disease. Veterinarians might seem like the greatest risk for farm to farm transmission of disease but they are unlikely to spread disease over a very large area due to the geographical confines of their practice area and their extensive biosecurity education. The global concern is with our rapid and extensive air transportation system that would allow a person to travel from a country with a disease endemic to a disease free country in a matter of hours. The best way to combat this likelihood is
to educate the general public about biosecurity steps they should take and encourage full honesty and cooperation with customs and border control agents, and customs forms to ensure that agricultural precautions instigated by governments are followed.

Biosecurity is becoming more complex in the global marketplace but the concern is more widely accepted then many other animal welfare concerns. The ease and high cost of failed biosecurity procedures is of concern to almost all animal agriculture stakeholders. Unfortunately, biosecurity is sometimes not considered by those well-meaning individuals who advocate for more traditional and naturalist approaches to animal husbandry and animal welfare.

TRANSPORT

Moving from one location to another is a highly stressful event in an animal’s life. There is no way to make transport a stress-free event for animals but, by taking account of a few behavioral concepts, the stress of relocation can be diminished. Aspects often associated with relocation that are stressful for animals include: changes in the group members (need to re-establish social hierarchies), human interaction, medical procedures, loading into a strange new environment, the environment while in transit, the animal's instability while moving, and unloading into a new environment. Stress can be reduced by better management of relocation stressors (Micera et al., 2010).

The first step in reducing transport stress is to plan ahead. Animals should be sorted into the groups with which they will be transported at least a week in advance if possible. This allows for establishment of a social hierarchy before the other transport stressors occur. Presorting will also allow for correction of another common transport error. Often, as animals are sorted for transport, caregivers will use the opportunity to preform medical procedures such as castrations and vaccinations. This is not only a medically dangerous time to do any surgical procedure but the high stress of transport often causes the animal to have a suboptimal reaction to any vaccines that are given. Giving vaccines sufficiently in advance of transport allows the animals to develop a stronger immune response and to have active antibodies to protect against diseases that they will be at risk for at their destination prior to arrival.

Having appropriate and well maintained loading equipment is imperative to reduce loading stress. The correct equipment will allow animals to be loaded with limited human encouragement. The use of an electric prod is strongly discouraged except in extremely difficult situations. Persons involved with the transport of animals should understand the species specific guidelines for loading and transport equipment, handling, and appropriate space allowances for animals in transit. In many countries, these types of guidelines are available from industry trade groups and agricultural universities that have developed standards for the management of environmental conditions during transit. Some of these guidelines can also be found on the internet.

Once animals reach their destination, it is important that they be given the opportunity to adjust to and explore their new environment at their own pace if possible. This is often not possible in a slaughter setting but should be done in a new farm or feedlot setting. Handling of animals should be limited until they have adjusted to their new environment.
SLAUGHTER HANDLING

The handling of animals in slaughter plants has received a great deal of attention in the United States for the last 50 years or so and has undergone many important improvements. There is still a great deal of work to be done in the area of increasing the industry standard to the level of the current top preforming slaughter plants. However, there are areas of the world that still have very poor animal welfare in slaughter plants and as animal agriculture becomes more global so should the implementation of higher animal welfare standards. Working on global initiatives to improve handling equipment at slaughter plants, to increase welfare training of staff, and to implement effective auditing programs with follow-up by management to correct issues raised by the audit should be a priority for the animal agriculture industry.

There are many useful written and media documents available for those interested in improving animal welfare in slaughterhouses. From an Islamic perspective, slaughterhouse animal welfare and worker welfare should be a top priority. The previously mentioned Hadith about sparing the suffering of animals to be slaughtered sets a precedent for good animal welfare. This should be a goal that every Muslim slaughter person is aware of and constantly working toward. It becomes even more important when slaughter without prior intervention is being used.

There are varying scholarly opinions on what type of prior interventions, if any, should be allowed for halal slaughter, but most Muslims have a preference for meat that is not interfered with prior to traditional slaughter. What follows is an explanation of common welfare problems that can happen during traditional slaughter and some practical ways to prevent them.

The first and most important consideration when doing traditional slaughter is how the animal will be restrained. In the case of poultry manual restraint, restraint using a cone, or shackling (if done carefully without causing pain to the legs) are currently acceptable from a welfare perspective. If using manual restraint, care must be taken not to break any bones prior to slaughter. Gentle handling will prevent damage to the meat and improve animal welfare. If a cone is used to restrain the bird, care should be taken to carefully fold the wings prior to insertion into the cone to prevent wing damage. If the animal is going to be shackled prior to slaughter, it is very important that it be done gently and that the animal is hanging from both legs using shackles that are the proper size for the bird.

For small ruminants such as sheep and goats, acceptable means of restraint include: manual restraint without casting, a squeeze box restraint, a V restraint, and a double rail restraint. Casting or hanging an animal while it is conscience is poor animal welfare and more dangerous for the humans slaughtering the animal. Hanging a conscious sheep or goat by one or two hind legs is still a common practice in the halal industry and alternative practices should be adopted. While casting may be a necessary alternative for more mature small ruminants when proper restraint devices are not available, upright restraint boxes for small animals are not very costly to build and would greatly improve animal welfare.

When considering large ruminants such as cows, oxen, and camels, manual restraint is neither safe nor practical. The ideal form of restraint from an animal welfare context is a smoothly functioning upright restraint box with a head holder.
operating such a box, it is important that the animal not be squeezed too hard and the
slaughter should happen as quickly after restraint as possible (Kadim, 2012). Inverting
boxes that rotate the cow to some degree prior to slaughter are also fairly common
in the halal industry. If properly designed and maintained, they can be acceptable.
If these are used, the animal should be slaughtered as quickly as possible after it is
rotated as ruminants are distressed by changes in orientation. The inverted restraint
boxes must be designed to comfortably accommodate the animal in the inverted posi-
tion and must be of the correct size for the animal (Ljungberg et al., 2007).

Hoisting conscious cattle is not an acceptable format for slaughter from an animal
welfare perspective. Hoisting or dragging conscience cattle still happens in parts of
the halal industry and it is a moral imperative that alternative means of slaughter are
adopted as soon as possible. Some of the best advice on how to engineer welfare friendly
restraint devices can be found on Temple Grandin’s website (www.grandin.com/)
along with some of her publications.

The next most important part of a traditional slaughter is knife selection and care.
Knives should be as sharp as possible and free of nicks. It is also very important that
the right size knife be selected for the animal being slaughtered. It is advisable to
have a knife that is twice as long as the neck is wide with a straight blade. Using a
smaller than desirable knife can lead to the slaughter person having to make multiple
cuts and possibly stabbing the animal, which is more painful to the animal and pro-
hibited in Islamic law, and using too large a knife can lead to human fatigue, which
may cause more errors (Anil et al., 2000; Limon et al., 2010; Önenç and Kaya, 2004).
The halal industry does not currently have any form of mandatory training in place
for its slaughter persons, which sometimes leads to poorly trained individuals using
poorly sized dull knives. If traditional slaughter is going to continue to occur, this
issue must be addressed. The halal slaughter industry should implement appropriate
training and auditing systems to ensure that animal welfare is maintained at the high-
est possible level currently available, namely, best practices (Gibson et al., 2009).

A final consideration for traditional slaughter is ensuring that no further processing
is done until the animal is completely dead. Animals that are still conscious should
not be dragged or moved but can be hung on the slaughter line, which also may help
improve bleed-out. These stipulations are very consistent with both Islamic law and
the animal welfare laws that are found in many countries (Hambrecht et al., 2004).

If all of the above welfare standards are met, it is the opinion of the authors that
traditional slaughter without a prior intervention can be done in a manner consistent
with good animal welfare. However, slaughter without prior intervention requires
that constant attention be paid to the welfare of the animals at all times including
using the best equipment the right way. Auditing and training should also emphasize
the respect for animals by the halal slaughter industry in keeping with the religious
requirements (Apple et al., 2005; Schaefer et al., 2001).

**CONCLUSIONS**

Many of the animal welfare issues that face the halal animal industry are the same
issues that face all of animal agriculture. The moral standards of Islam demand that
Muslims and the halal meat industry take precautions to protect animal welfare.
This goal can be most effectively achieved through a partnership with science, technology, and the animal agricultural industry. The path forward for all sectors of animal agriculture should be one of good science informed by ethical and moral considerations for the animals that live in service to mankind.

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