The issue of farm animal welfare has become increasingly of essence in many countries these days. Farm animal welfare concerns are expressed about the conditions in which farm animals are kept and management practices, particularly in systems where animals are kept in confinement for most of their lives, feed methods, health care, and expression of normal behaviors. The use of an ethical basis for animal welfare standards requires some generally accepted principles on how animals should be treated and used by humans. Animals have enormous capacity to feel a huge range of emotions, to learn from their experiences, to adapt to challenges, and to suffer when their needs are either ignored or disrespected. It is now time, in the evolution of the relationship between humans and animals, to move forward with this knowledge and take real action to improve the lives of farm animals. The use of behavioral principles should improve efficiency of livestock handling and reduce stress on animals. Changing public opinion about the importance of good animal welfare and applying legislative actions will be important in animal production systems especially in developing countries where the poor animal welfare is immense and production management is below substandards.

1. Introduction

In the past few decades, farm animal husbandry has undergone an intensification in developed countries, which has resulted in increased effectiveness but also in public concern about the welfare of farm animals [1]. Authorities in the western hemisphere are therefore under on-going pressure to address animal welfare issues in farming [1]. On the other hand handling and welfare status of farm animals is below the standards in developing countries where animals are poorly handled due to misconception and resource scarcity. However, as improvements into farm animal welfare are frequently linked to increased production costs and reduced productivity, a tightening of animal welfare legislation at national level might cause livestock production to be relocated to countries where the standards are lower. Moreover, a policy of restricting imports of livestock products by insisting on domestic animal welfare standards risks infringing international trade agreements [2]. As a consequence, policy makers in developed countries have shown a growing interest in strategies where consumer demand for animal welfare-friendly products is expected to drive up animal welfare standards [3] though this is not the case in developing countries.

Ethiopia is one of the biggest livestock populations in Africa [4]. According to FAO, there were 53.4 million cattle, 25.5 million sheep, and 22.8 million goats in Ethiopia in 2011 [5]. Furthermore, Ethiopia was the country with highest livestock population in Africa at the end of the 20th century [6]. In fact, the fast development of the economics has been highly dependent on agriculture resources. According to Mengistu [7], agriculture has played a central role in economics over the years and contributes to almost 40% of total GDP (around 20% of this comes from livestock and their products). Ethiopia is a country with a high level of diversity in agriculture and with high amount of livestock resources. However, genetic resources have not been evaluated sufficiently yet and more research is needed. Although the country is developing and the economic condition is improving, animal welfare is a subject that so far has not gained much attention. At present, there are no legislations that protect animals from cruel actions by humans. However, there are a few organisations that work for animals’ situation but they mainly focus on homeless and/or injured animals,
mostly donkeys [8]. Such strategies rely on understanding the status of farm animal handling and management so as to design appropriate regulation and action on animal welfare in developing countries like Ethiopia.

2. Animal Welfare Perceptions and Attitudes at International Level

The current state of knowledge understands that animal welfare is a major consideration in meat production and is based on the belief that farm animals usually suffer from handling and environmental problems. But animal welfare is beyond the scope of meat production and may be considered in terms of the subject experiences of animals (measured using preference testing) or in terms of biological functioning.

According to Broom [9], (a) the welfare of an animal is its state as regards its attempts to cope with its environment; for each coping system, the environment is that which is external to the system. (b) One important part of the animal’s state is that which involves attempts to cope with pathology (i.e., the health of the animal); so, health is part of welfare. (c) Feelings are a part of many mechanisms for attempting to cope with good and bad aspects of life and most feelings must have evolved because of their beneficial effects; so, they are also an important part of welfare. (d) The extent to which coping attempts are succeeding and the amount which has to be done in order to cope must both be considered as a part of welfare. (e) The scientific assessment of welfare must be quite separate from any moral judgment; there is variation among people with respect to how poor the welfare of a farm animal has to be before they consider it to be intolerable. (f) The many mechanisms which exist within most animals for trying to cope with their environment and the various consequences of failure to cope mean that there are many possible measures of welfare.

The animal products industry operates in a competitive marketplace. How consumers view its products is crucial to the economic success of the industry [10]. In making purchasing decisions, consumers primarily consider prices and product attributes. As a consumer’s income increases, the range of attributes demanded expands beyond basic requirements of product safety to more demanding requirements, such as the use of particular methods of production. Animal welfare standards fall under the latter category. Wealthy consumers in developed economies are beginning to consider animal care expectations. Low-income consumers are focused first on safe, wholesome, nutritious, and affordable foods [11].

A number of surveys have been conducted in the United States to assess public attitudes toward farm animal welfare [11]. In general, these indicate that there is substantial public confidence in farmers and ranchers in the treatment of animals. However, the surveys also seem to indicate there are increasing concerns about certain production practices, such as housing systems for veal calves and intensive confinement for pigs and poultry [10]. To some extent, public concerns may be connected to other issues such as food safety, the decline of traditional family farms, the growth of large animal production units and resulting environmental implications, the impact of new technologies, and the effects of globalization.

Animal welfare issues are championed by a range of interest groups with agendas that range from improving the conditions under which animals are raised for food to elimination of the use of animals for food or clothing [11]. While there are questions about the extent to which some of the views of these pressure groups would be shared by the majority of the public, it seems clear that the groups have been effective in raising the profile of animal welfare issues and in some part stimulating a response by the food industry. It is difficult to separate the desire of firms and producer groups to be more socially responsible from simply reacting to activist groups. However, it is clear that pressure from such organizations was one component of multiple forces that prompted the development of the egg and hog industry [10]. Rules on the protection of calves and pigs were introduced in 1991 and for the protection of all farm animals in 1998 [10]. The latter covers animals of all species kept for the production of food, wool, skin, or fur, or for other farming purposes including fish, reptiles, or amphibians. The new rules will eventually result in the elimination of traditional cage systems for laying hens and individual pens or stalls for calves and pigs. Currently, consideration is being given to adoption of tighter rules for the production of broilers, including a significant reduction in maximum stocking density. Other European countries, for example, Switzerland, have legislation that prohibits or controls a range of production practices for farm animals [11].

As noted earlier, developments in major importing countries can be a factor in the development of animal welfare policies. Introduced in 1999, New Zealand’s animal welfare law seems designed to protect its position as a major exporter to European markets. It is interesting to note that existing industry-derived voluntary codes of practice are being reviewed and modified for incorporation under the legislation [11]. Australia, another major exporter of animal products, introduced a national animal welfare strategy in 2004 to address a range of concerns. The animal products industry faces two major issues in the area of animal welfare, questions being raised about production and handling practices and how to respond to those questions. The central question then becomes what exactly constitutes humane treatment. If we had a clear answer, we would be able to identify which current practices are acceptable and which are not. Unfortunately, a clear answer does not exist because it depends on specific beliefs and moral values that differ across individuals [12].

3. Significance of Animal Welfare and Handling for Animal Products

Smith and Grandin [13] believe proper handling of meat animals can improve productivity, quality, and profitability, so, it is just good business to do it right. Appropriate handling weakens arguments by animal rightists/welfarists that those in the production and packing sectors do not have a caring

(a) The most important factor determining whether a production/packing enterprise has good or bad animal welfare practices is the attitude of management personnel.

(b) The companies that have good animal welfare practices have a top manager who “cares” about animal welfare; as upper-management personnel change, animal welfare practices can improve or decline, depending largely upon the attitude of the new people.

(c) The best facilities and the latest technology make handling livestock easier but unless the owner or manager is convinced that proper handling practices are economically rewarding, it is unlikely that the employees will routinely follow appropriate practices and procedures.

(d) The manager that is most effective in maintaining high animal welfare standards is involved enough in the day-to-day operations to know and care, but not so involved that he/she becomes numb and desensitized [15].

Farm animals are most often transported to achieve translocation immediately prior to harvest and also to move them to sources of less expensive or more abundant feed supplies (for growth or fattening), because of changes in ownership, for breeding purposes, to enter intensive production units, or for exhibition in shows or contests. Tarrant and Grandin [16] characterized the transport process as follows. (a) During transport, animals are exposed to environmental stresses including heat, cold, humidity, noise, motion, and social regrouping. (b) Transportation by its nature is an unfamiliar and threatening event in the life of an animal. (c) Transportation involves a series of handling and confinement situations which are unavoidably stressful and can lead to distress, injury, or even death of the animal unless properly planned and carried out. (d) Transportation often coincides with a change in ownership whereby responsibility for the animal’s welfare may be compromised.

Gonyou [17] described “Behavioural Principles of Animal Handling and Transport” drawing the following conclusions. (a) Handling and transport involve two distinct types of action: movement to a new location and remaining stationary. It is generally advisable to use the minimal amount of attractive or repulsive force as possible in moving animals; and when using any means of restraint, it is necessary to weigh the benefits of a controlled animal against the distress it causes the animal. (b) Behavioral features related to handling and transport include the flocking instinct, visual field, and flight distance; genetics, sex, and previous experience also influence the response of animals. (c) Important in handling and transport of animals are these human/animal interactions, exposing animals to human contact before it is required for management routines, and having some persons responsible for the most aversive procedures and other persons responsible for the day-to-day management of the animals. (d) Movement is enhanced if the physical environment—the equipment and penning—is attractive to the animal and does not provoke fear. A number of factors limiting the market for animal welfare-friendly products have been identified.

A study by Grunert et al. [18] clearly indicated that animal welfare competes with a long range of other, possibly more important, quality traits, such as taste, tenderness, cut, and safety, in guiding consumer choice. Moreover, even if consumers have a preference for animal welfare-friendly food, not only insufficient labeling but also poor availability and price premiums that exceed their willingness to pay may prevent them from expressing this in their market behavior [19]. The possible presence of such consumption barriers implies that the extent to which consumer demand for welfare-approved foods may drive up animal welfare standards remains uncertain.

In the past, our systems of agricultural production focused mainly on issues such as supply, price, and competition. Nowadays, it is recognized that consumer requirements form the bottom line for any effort intended to achieve the ultimate fine-tuning necessary to assure societal and economic sustainability of agri- and food-chains. Thus, more and more attention is given to emerging new consumer concerns and societal needs, and animal welfare has become an issue of increasing significance [20, 21]. Consumers now expect their animal-related products, especially food, to be produced and processed with greater respect for the welfare of the animals. Furthermore, it is acknowledged that improving an animal’s welfare can positively affect numerous aspects of product quality (e.g., reducing the occurrence of tough or watery meat as well as the incidence of bruising, bone breakage, blood spots, and abnormal eggshells), pathology (alleviating fear reduces the potential development of pathological anxiety), and disease resistance (decreasing the immunosuppressive effect of chronic stress and the need for antibiotics); these effects have direct relevance to food quality and safety [22, 23]. In order to accommodate societal concerns about the welfare quality of animal food products as well as related market demands, for example, welfare as a constituent aspect of product image, there is a pressing need to develop reliable on-farm monitoring systems for assessing the animals’ welfare status, identifying and evaluating potential risks, and developing and validating practicable strategies to improve farm animal welfare from farm to slaughter [24].

4. Farm Animal Welfare Indicators and Welfare Improvement Strategies

4.1. Indicators of Animal Welfare Status. It seems incontrovertible that an animal that dies because of some failure or inadequacy of a husbandry or handling system has had its welfare compromised totally [9]. Moreover, systems that result in higher mortalities are also likely to be detrimental to the welfare of all animals, not just those that die, since the conditions that result in the death of some individuals often affect all. Mortality rates are therefore a very objective, albeit crude, indicator of welfare [25]. Physical injury, resulting
in broken bones or bruising, is by analogy with human experience painful. The prevalence of bruises or the number of broken bonds can therefore, like mortality, be used as a welfare indicator. The prevalence of bruises is greater in the carcasses of cattle and sheep that have passed through live auction markets than in those from animals sold directly from the farm. Because of this it is possible to infer that the welfare of animals sold through markets is in general likely poor.

Poor welfare may be indicated by changes in the behavior of the animal [25]. Animals can show changes in the levels of behavior, for example, reduced activity and responsiveness. Tail biting in pigs, and feather pecking in poultry, are probably abnormal behaviors caused by inadequacies (from the animal’s point of view) in the rearing environment [9]. Abnormal behavior patterns often reflect inadequacies of the animal’s environment. Although the animal’s physical needs are being met, its mental needs are not [25]. Defining exactly what these needs are is often difficult because it is important to understand what the animal is thinking [26]. Simple behavioral observations, particularly those related to feeding, drinking, or resting, can give valuable insights into the animal’s feelings, allowing some assessment to be made of how fatigued, hungry, or thirsty animals are. It might be possible to test whether different times or conditions of transport were more or less aversive to animals by measuring whether they showed greater reluctance to enter the vehicle with repeated exposures to the treatment.

4.2. Welfare Improvement Strategies. Many animals (particularly poultry and pigs) are kept under low levels of sensory input in modern farming systems; this is likely to engender boredom, depression, fear, pathological anxiety, and the development of behavioral vices [22, 27]. Furthermore, farming practice has often changed too rapidly and frequently for the animals’ biology and behavior to evolve appropriately and at the same pace [23]. Of course, changes to housing and husbandry systems or to breeding programmes must be practicable and affordable for developing countries. Within these constraints, innovative, knowledge-based, and species-specific strategies for improving on-farm animal welfare will be defined. Since welfare is determined by internal as well as external variables both genetic and environmental solutions to welfare problems will be sought. Indeed, it is increasingly recognised that selective breeding is a powerful tool for alleviating welfare problems [23] and that appropriate environmental enrichment, including positive human contact, can dramatically enhance welfare [22]. Collectively, our efforts will be aimed at minimizing the elicitation and expression of damaging behavioral and physiological traits and states, improving the human-animal relationship, and providing the animals with safe and stimulating environments.

5. Farm Animal Welfare and Handling in Ethiopia

In Ethiopia, the idea of Homeless Animals Protection Society is first originated in the Bale mountains national park (BMNP), [28]. The main target is to humanely reduce the number of homeless dogs by applying animal birth control (ABC) program through trap neuter release (TNR) method and vaccinate against rabies in order to save the endangered Ethiopian wolf from threat of extinction, rabies, and hybridization. The idea of this society is emanated due to the measures used to be taken in the BMNP to eliminate homeless dogs and to save the endangered Ethiopian wolf from rabies and hybridization; the measures were shooting and poisoning which never helps to solve the problem though they were practiced for the past several years. According to HAPS [28], few of the park staffs who noticed the cruelty and ineffectiveness of the above mentioned measures from their past experience decided to establish this society in order to solve the problem and save the animals from cruel activities and also from extinction.

The focus of homeless animals protection society (HAPS) is primarily to protect homeless dogs in order to reduce the problems they are causing to their surroundings and to themselves [28]. The purpose of this organization is to promote animal welfare and right primarily through community education and then try to reduce the suffering of homeless dogs through vaccination and neutering. Based on this, HAPS is founded in October 29, 2001, as the first of its kind in the country to help the helpless animals and solve the problem. For the time being HAPS mainly focused on homeless dogs [28]. These are dogs that were owned by people and abounded due to several social and economical reasons in which their number is increasing from time to time due to improper management of their population. Government agencies used poisoning homeless dogs as a means of population control and rabies prevention and this is done several times within a year but the problem was never solved. Therefore HAPS idea is very important in terms of awareness creation concerning animal welfare and proper handling of pet animals through its educational campaign and homeless dogs population control through its spay neuter program.

Animal handling is an important subject since it affects not only animals’ emotional states but also economics due to the fact that abusive handling can, or most likely will, result in lowered production [29]. Furthermore, animals that are considered to be especially hard to handle possess a great risk for handlers, which increases the cost of animals and makes them harder to sell [30]. How animals are behaving during handling is dependent mainly on genetics but also on previous experiences [31]. In Ethiopia, handling of animals is usually aversive [32] and therefore in conflict with animal welfare. If animals fail to cope with environmental stressors, it is likely that they will express chronic stress. This will result in lowered animal welfare, which leads to the proclamation that welfare of an animal is said to be good when it can manage to cope with stress factors satisfactorily.

Several market systems exist for trading animals in Ethiopia. The transport to markets is mostly by trekking, due to lack of suitable vehicles, and there has been research performed on how many animals die and get injured during transport [33]. Furthermore, transport conditions and level of vibration have a direct impact on the behaviours an animal expresses and the changes of stress hormones [33]. The ranges
of behaviours that an animal expresses are good indicators of how the animal copes with certain situations. If a behavioural change is observed, that is, the animal refuses to move or vocalise in a high extent, it may indicate what the problem is and where in the situation improvement is needed [34]. There are a variety of aspects affecting an animal's welfare and therefore a unified definition of the desirable welfare state has not yet been adapted. However, the term animal welfare can be looked at from three different perspectives [35]:

1. **The biological state** describes welfare of an individual as good, when the animal is healthy and grows and reproduces well.
2. **The affective state** stresses potential for animals to suffer or to have positive experiences.
3. **The natural state** explains differences between captive animals and the wild state where they origin from, and to what extent they are able to express natural behaviours.

From the animals’ perspective, the most important aspect is how it manages to cope with environmental stressors. When behavioural and physiological stress responses are thwarted or if it fails to maintain homeostasis, it is likely that the animal will express chronic stress. Symptoms of this can be injurious behaviour to themselves, for example, self-mutilation or chronic activation of the autonomic nervous system. This will evidently result in lowered animal welfare. Therefore, welfare of an animal is said to be good when stress responses are not chronically activated and when the individual can cope with them successfully.

The World Organization for Animal Health (OIE) implemented the first international guidelines for animal welfare in 2005. In total, 167 countries accepted these [36]. However, there is still a lack of guidelines and regulations for animal welfare in Ethiopia [8]. The five freedoms outlined in the 1970s in England and have since then been a fundamental basis for animal welfare all over the world [1]:

1. **freedom from hunger and thirst**: by providing constant access to fresh water and a diet to maintain full health and vigour;
2. **freedom from discomfort**: by providing an appropriate environment including shelter and a comfortable resting area;
3. **freedom from pain, injury, or disease**: by prevention or rapid diagnosis and treatment;
4. **freedom to express normal behaviour**: by providing sufficient space, proper facilities, and company of the animal's own kind;
5. **freedom from fear and distress**: by ensuring conditions and treatment which avoid mental suffering.

It has been shown that handling routines that are stressful for animals can reduce their immune function and most likely result in lowered productivity (e.g., growth rate, meat production, and milk production) [29]. Some cattle are said to be uncontrollable and wild, which presents a safety risk to their handlers, making them cost more to own and harder to sell for profit. Besides, they are more predisposed to stress and their conversion of feed to meat is not as efficient as with calmer cattle. Genetics are another factor that affects animals' behaviour and stress levels during handling [30]. In contrast, animals that are handled with minimum level of stress and low impact of aversive handling have less risk of injuring themselves, other animals, and their human handlers. This will make handling procedures more effective since routines will take less time and demand fewer people, which is favourable from an economic standpoint [29].

Although it has been shown by Hemsworth [37] that an animal’s fear of humans can limit productivity and welfare of farm animals. Hemsworth [37] also revealed that associations between a positive handling, for example, tactile contact and verbal effort, were negatively correlated with the use of negative tactile interactions, for example, pushes, which were positively associated with an animals’ fear of humans. Stakeholders, who have inadequate attitudes towards animals when interacting with them, are believed to affect the behavioural response of animals towards humans. Thus, productivity of animals is affected and likewise, associated with increased fear of humans. This is believed to reduce animal welfare [37].

The handling of animals in developing countries has been a subject for critical discussion for a long time and is in need of further research. A recent study indicated that stakeholders in Ethiopia handle animals in an aversive way, which has been shown to increase prevalence of death and injuries [32]. By measuring behavioural or physiological conditions, animal handling can be explained to a higher extent and a welfare concept implemented. When adult male cattle are mixed in lairage or during transport, they express higher levels of fighting behaviour which can be recorded and measured as a welfare indicator. Another established method for this is to use the fact that farm animals that are handled or transported remember previous situations where they have been exposed to aversive handling by stakeholders. The larger the hesitance animals show, the greater the previous aversion must have been [9].

The different behaviours that an animal expresses are good indicators of how the animal is coping with the situation. If behaviours change, that is, animal refuses to move, or animal freezes or vocalises, it may indicate where in the situation there is a problem. Apart from behavioural measurements, physiological measurements are usually performed. This involves measuring heart rate, body temperature, and hormonal changes [34]. Furthermore, injuries on animals are shown to increase if vehicle is poorly constructed or simply if they are hit by handler. Some factors that influence animal welfare during handling and transport are [9]:

1. the attitudes of stakeholders and their driving skills,
2. laws and codes of practice,
3. genetic differences between breeds and different selection pressure,
4. the design of vehicle for transport and design of equipment used for loading,
(5) the stocking density of animals and mixing of unfamiliar animals,
(6) payment of persons working with animals,
(7) the actual physical condition such as temperature, humidity, and risk of disease transmission,
(8) the methods used during handling, loading, and unloading.

The transportation of indigenous B. Indicus breeds during the hot-dry season in Nigeria was associated with multiple stress factors. These were shown to affect health, productivity and market value of animals. It has been shown that transport conditions, level of vibration on vehicle, behaviours the animal expresses and changes of stress hormones, contradict animal welfare to a great extent [32]. The most common way of transporting animals in Africa is by foot since there is a great lack of vehicles with sufficient capacity [4]. Walking animals by foot often leads to injured, dead or stolen animals, which were investigated by Bulitta, et al., [32] who found that 7.6% of animals died, 6-9% got injured and 2.8% were stolen. Furthermore, he found that lameness and injuries such as swelling of legs commonly occur. This has also been proven to be a problem when animals are transported by vehicle [4], and also alludes to the problems which accompany a lack of rest, water and feed.

6. Conclusion

In recent years, the issue of farm animal welfare has become increasingly important in several countries especially in developed ones. There are concerns expressed about the conditions in which farm animals are kept and management practices, particularly in systems where animals are kept in confinement for most of their lives. The use of an ethical basis for animal welfare standards requires some generally accepted principles on how animals should be treated and used by humans. There is now overwhelming scientific evidence that those animals possess a complex blend of physiological, behavioral, and neurobiological characteristics. Animals have enormous capacity to feel a huge range of emotions, to learn from their experiences, to adapt to challenges, to reason, and to suffer when their needs are either ignored or disrespected. It is now time, in the evolution of the relationship between humans and animals, to move forward with this knowledge and take real action to improve the lives of farm animals. The use of behavioral principles should improve efficiency of livestock handling and reduce stress on animals. Reducing stress also should help improve weight gain, reproductive performance, and animal health. In addition, education and enforcement of premier management practices associated with livestock handling are imperative. It is important that countries in Africa develop systems to inspect animal facilities and review research practices to ensure that animal welfare issues are addressed in all institutions and facilities dealing with animals. Changing public opinion about the importance of good animal welfare and applying legislative actions will be important in animal production systems especially in developing countries where the poor animal welfare is immense.

Conflict of Interests

The author declares that there is no conflict of interests regarding the publication of this paper.

References


