International Journal of Academic and Applied Research (IJAAR)
ISSN: 2643-9603
Vol. 10 Issue 5 May - 2026, Pages: 26-32

Issues In Organic Animal Agriculture: A Review

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ABSTRACT: *Animal health sector at the moment is in opposition to the continuous use of antibiotics growth promoters for livestock production. owing to the residual effect on the final consumer. Therefore, it has become so imperative to investigate issues in organic animal production that could boost performance without jeopardizing the health of man. In today's livestock, the production system has tremendously changed to a more intensive; with high animal productivity, due to better nutrition, health and housing management. However, the recent focus is on concerns over food quality, animal welfare and sustainability, human health and environmental quality which have led to the emergence growing interest in organic animal farming. Many tropical countries have found new opportunities in this novel market to export their organic animal products. Tropical countries have some natural advantages when it comes to organic livestock farming, which could be harnessed to boost organic livestock production for domestic consumption. To benefit maximally from this emerging system of food production, producers in developing countries must build their capacity and take into cognizance of their natural advantages and great benefit to the health of man and the environment. This review is targeted at bridging the lacuna, providing techniques/strategies and insights that will equip policy formulators and stakeholders in enhancing animal food sustainability, building capacity and optimization of the ecosystem.*

Keywords: Environment, Livestock, Natural, Health, Production

1.0 Introduction

Organic animal agriculture could be described as the livestock production/management system based on appropriate and harmonious interaction of the land, plants and livestock, and their effect on the physiological and behavioral needs of the animals to minimize stress, promote animal health, productivity and prevent diseases by good animal husbandry practices that is devoid the use of veterinary drugs and other chemical substances. In other words, organic animal husbandry is a system of animal production that encourages the use of organic and biodegradable inputs from the ecosystem for animal nutrition, animal health, animal housing and breeding (IFOAM, 2003). This is deliberately to avoid the use of synthetic materials such as drugs, feed additives and genetically engineered breeding inputs. Farmers in resource-constrained countries traditionally use few external inputs, such as allopathic medicines and antibiotics, and follow grazing-based extensive or semi-intensive production systems. In many ways, they are tilting closer to organic farming system, though largely by default. It has been observed that developing countries are becoming important suppliers of organically produced animal foods, since organic practices tend to suit the conditions under which their producers farm, especially in the case of smallholders living in the rural areas. In many parts of the world, consumers prefer organically produced livestock and products because they pay more attention to the safety and sanitary of food consumption and conservation of the environment. This has made it imperative to establish organic livestock production standard to be used as guidelines for organic livestock farming in order to get domestic as well as international acceptance. Most organic markets and consumers in developed countries are prepared to pay higher for organic products thereby making organic farming a niche area that has excellent prospects for exports.

1.1 General Principles of Organic Animal Agriculture

The following principles shall be followed in organic animal agriculture:

1.1.1 Mapped and dedicated farm areas for organic animal production must be managed and maintained in accordance with organic agriculture standard from production, processing, labeling to marketing.

1.1.2 Organic animal agriculture (production) shall be such that develop and maintain soil fertility, enhance the ecology and biodiversities and diversify the farming system.

1.1.3 Hence organic animal agriculture activities is related to ecology both physical and biological; ruminant animals shall have access to pasture while other animals shall have access to open air exercises to enhance good health and appropriate welfare for the animals.

1.1.4 The stocking capacity for the animals should be such that is appropriate to animal species, nutrients balance, feeding, stock health, and environmental effect.

1.1.5 The stockman should allow natural breeding to reduce stress and prevent diseases.

1.1.6 Use of chemicals or veterinary drugs during and after animal production should be totally avoided.

1.1.7 Integrating animal husbandry into crop producing farms (organic farming).

Developing and applying the principles of organic animal production at all times requires a thorough analysis of the problems and opportunities involved and existing local knowledge (Vaarst, *et al*., 2006).

1.2 Organic Animals and their Welfare

Good animal health and welfare is an important goal for organic husbandry. Organic animal farming further entails the promotion livestock welfare other than preventing stress and suffering. Unlimited access to 'natural' behavior is also recommended to broaden the concept of 'welfare' (FAO, 2015). Organic animal agriculture and animal welfare go hand in hand thereby giving animal production a bright future prospect. There will be recognized benefits for developing countries that can evolve niche markets in higher welfare products. The World Organization for Animal Health (WOAH) process for developing baseline standards for animal welfare will assist in the harmonization and uniformity of standards in this area. For instance, in Namibia, the development of animal welfare standards already plays an important role in market access. Namibia's quality assurance scheme, with its guaranteed traceability and animal welfare standards, has gained recognition for the Namibian beef industry of the quality of its products. Thus, resulting in increased market leverage and a trade advantage over its competitors. Producing organic animal food requires considerable attention, care, skill and, a strong connection to its market. Additionally, product's quality standard that must be met with an equal emphasis is placed on the methods of production. The 'organic' in organic animal agriculture is a labeling term that explains products that were produced in accordance with certain standards during food production, handling, processing and marketing, and confirms that these standards have been certified by a duly constituted certification body or authority. The implication being that the organic label is a process claim rather than a product claim.

1.3 Organic Animal Health

Pathogenic organisms and parasites are present virtually everywhere. As in the case of humans, animals have also immune systems which usually fight with these germs. The efficiency of the immune system will be reduced or completely destroyed if the animals are not properly fed, not allowed practice their natural behavior, or are under social stress etc. Feeding strategies and unique foodstuffs must be developed to reduce the cases of disease causing pathogens and enhance good breeding programs for organic animals. Improvements in animal housing and husbandry and a better understanding of mixed crop and livestock systems are also important. Designing feeding pattern that will provide enough nutrition and high livestock productivity in areas with environmental constraints, such as arid and semi-arid areas, is key. Health could be described as a balance between disease pressure (presence of germs and parasites) and the resistance (immune system and self-healing forces) of the animal. The stock keeper can influence both sides of this balance by strict adherence to organic animal agriculture, reducing the number of germs by maintaining good hygiene and strengthening the animals' ability to cope with germs. It is of great concern to the farmer to consider; why the immune system of the animal weak and not able to fight the disease or the parasite attack, how to improve the animals' immune system, enhance living conditions and hygiene and obtain the best performance from the animal. Organic farmers rely instead on treatments such as herbs, vitamins and minerals, homoeopathy, acupuncture, and dietary additives such as pro-biotics. However, this may not be satisfactory always for health problems; and when an organic treatment is not effective in yielding the required result, conventional treatment must be used but strictly on certified standard.

1.3.1 Disease Prevention

Organic livestock husbandry places more emphasis on preventive measures so as to keep animals in good state of healthy, rather than on curative methods. This, the farmer will do by keeping a more resistant breed. Again, the conditions that the animals are kept should be optimal and the type that will amply provide sufficient space, light and air, dry and clean bedding, frequent exercise, e.g. grazing, and proper hygiene. Animal health (resistance to diseases) is also a function of the quality and quantity of fodder that they are exposed to. Where all the organic preventive measures are adhered to, farm animals will seldom be sick. Where treatment becomes absolutely important, alternative medicine that is based on herbal and traditional remedies should be adopted. The standard of organic animal agriculture is such that gives priority to management pattern/practices, that encourage the resistance of the animals and thus preventing the outbreak of farm animal diseases. Where there is breakout of diseases, it may suggest that the conditions under which the animals are reared are not suitable and therefore requires necessary adjustments.

1.3.2 Organic Management of Ecto and Endo Parasites

Conventional preparations are not usually allowed in the management of ecto and endo parasites where organic animal production is practiced. On the extreme case of infestation, conventional drenching may be permitted but must follow laid down standard that is devoid of routine use which may result in the development of resistance. Many substances and organic materials abound for the management of both endo and ecto parasites in farm animals amongst which are; drenches made from a mixture of natural products such as garlic, molasses, vegetable oil and cider vinegar. Copper sulphate in small doses is also favored by some organic animal farmers. Some other farmers may also chose to use aloe vera, clay products, diatomaceous earth, vegetable and tree products, and Nutrimol®

Many other farmers use homoeopathic remedies with reported near perfect results. This works on the principle that 'substances usually in extreme dilutions which, when given to healthy individuals, produce the same symptoms as the disease being treated … the whole organism is treated in an attempt to raise its levels of resistance and stimulate its ability to throw off disease' (MacLeod 1981).

2.0 Some Important Considerations in Organic Animal Production

It is of great imperative that the farmer/producer and other stakeholders in organic livestock production take into account the following:

- Animal feed
- Origin of animals

- Animals' living environment and conditions
- Management of animal waste
- Animals' health care
- Record keeping of farm animals.

2.1 Animal feed

The total rations of farm animals that are manufactured under organic management must consist of agricultural products that have been organically produced and handled organically. This will thus include; pasture, forage and crops. Certain non-synthetic and synthetic substances may be used as feed additives and supplements. About twenty percent (20%) of the dairy feed for cattle within nine months of age may be allowed to come from non-organic sources. Plastic pellets, urea, manure and by-products from mammalian or poultry slaughter are not allowed.

2.2 Origin of Animals

Animals and all their products that are advertised or labeled and sold as organic must be raised under continuous organic management from the last third of gestation or at hatching. This will give credence to the originality of the organic nature of the animal/products.

2.3 Animals' living environment and conditions

Organic livestock farmers as a matter of importance must create and uphold living environments and conditions that will promote good health and accommodate the natural behavior of the animal. Some of these living conditions must encompass access to the outdoors, shade, shelter, fresh air, direct sunlight suitable for the desired species and unlimited access to pastures for ruminant animals.

2.4 Management of Livestock Waste

Animal waste/manure must be properly handled if it must be symbiotically beneficial to the farmer, animals and the environment. It is by that livestock organic farmers manage manure so that it does not contribute to the contamination of crops, soil or water and optimizes the recycling of nutrients.

2.5 Animal Health Care

This will require that organic animal producers establish preventive health care practices. These practices include:

i. good selection the appropriate type and species of animals,
ii. placing animals on adequate ration,
iii. creating a conducive environment that will guarantee freedom from stress, disease and parasites,
iv. appropriate diseases management practices and
v. following organic animal husbandry practices to promote animal well-being.

2.6 Record keeping of Farm Animals.

Adequate animal record keeping is overwhelmingly imperative if the livestock farmer must make noticeable progress in the venture. Livestock records will certainly strengthen the financial management of organic animal enterprise. Records are also important to verify the organic status of the animals and the production, harvesting and handling practices associated with them.

3.0 Standardization/Certification of Organic Animal Production

Contrary to the conventional/traditional production systems, organic animal production systems are regulated by certain standards that must be strictly adhered to by animal producers. Their compliance to these standards is verified by certification authorities empowered by their respective governments. Upon meeting the laid down criteria and guidelines, a farm may be classified as organic. Production quality under organic management is ensured through certification procedures that are of internationally accepted standards. The organic animal certification guarantees not only the quality of the product but also the quality of the production process. This is against the practice in conventional production process where there is no guarantee to production methods and procedures. In organic farming, production methods are certified to be safe and sound, as well as environmentally friendly. Plant and animal products intended for human consumption, and animal feed that is produced, processed and handled in accordance with these standards, are labeled 'organic products'. They are considered to be consumer/market driven, since such products are clearly identified through certification and labeling. Consumers' strict opinion on how their food should to be produced, processed, handled and marketed forms a guiding principle to the producers. Production standards cum consumers efforts are needed to enhance organic livestock production and make it an economically rewarding enterprise for farmers. This can partially be attained through networking. The European Union (EU) countries established a Network for Animal Health and Welfare in Organic Agriculture (NAHWOA) to develop organic animal production. This is a collaboration of research forum on animal health and welfare in organic livestock production. Between the period of 1999 and 2001, European Union funded the network. This network saw the coming together of experts from seventeen research institutes in thirteen European countries. Likewise, In a like manner, this network can

be formed in other continents of the world such as Asian, African and Latin American that have resemblance in their agro-climatic and socio-economic conditions (Chander and Wanapat, 2006).

4.0 Organic Animal Nutrition

Nutrition is one of the major constraints to the survival and satisfactory productivity of farm animals across the globe. This involves food supply for any type of internal and external uses. Nutrition encompasses the ingestion, digestion, transportation, absorption and assimilation of the various nutrients and their transportation to all body cells and the removal of the unusable elements and waste products of metabolism (McDonald *et al.*, 2011). In the real essence, nutrition is the provision of all essential nutrients in adequate amounts and in optimum proportions. It can also be viewed as the scientific way food is used by human body, livestock and other living organisms. In organic farming, animal husbandry aims to provide a diet that the animals are best adapted to. The aim is not to maximize weight gain at the detriment of animal health. Although adequate nutrition seeks to produce good yields, it has serious effect on animal health and is therefore very important in disease prevention. Diversity in diets is the key. A balanced diet helps to meet the animals' physiological needs. Lampkin (1990) observed that cows with high production levels due to emphasis on concentrates in their diet have a shorter productive life. In organic farming (crop and animal), crop rotation with a variety of species of plant in the pasture will aid in attaining diet diversity. Mixture of deep-rooted and shallow-rooted species increases the potential for nutrients to be available and helps eliminate nutrient inadequacies. Legumes such as lucerne can supply adequate organic nitrogen to the grass component of pastures and help recycle deep nutrients that will in turn enhance animal productivity.

5.0 Organic Animal/Crop Farming

Organic farming is could be seen as the 'farming without the addition of artificial chemicals. Artificial chemical therefore implies a substance that has been manufactured or processed chemically. Here, the definition includes the word 'addition' hence organic farming is not necessarily chemical-free farming. There are also artificial chemicals in the soil, water and the air. The term 'organic' has several meanings but in this context of agriculture, it refers to whole-farm management. This may mean that the farm is treated as a living organism with symbiotic relationship. Farm animals play a vital role in organic farming. Crop nutrition is improved when a pasture or grazing phase is incorporated in the cropping rotation. This is exercise is carried in areas you have broad-acre systems and in some annual production circles. Important nutritional advantages offered by a pasture phase include nitrogen fixation by legume component and the recycling of organic matter and nutrients as a result animal droppings/manure. Pasture phase could be used to control/suppress pests, disease and weeds by breaking the disease cycle. Nitrogen fixed by legumes and other nutrients consumed by livestock during grazing are returned to soil in manure and urine. Therefore, if the farmer is careful in organic farm management, livestock and manure could be highly beneficial in nutrient cycling. Preparing or composting animal manure is generally required, especially if the manure is obtained from elsewhere other than the organic farm where the farmer oversees. In some larger farms, livestock are used for extensive weed control on organic farms. This is because they can be used to graze down weeds before a crop is sown or after crop establishment for weed control. Organic farming is mainly focused on good environmental management encourages irrigation scheduling.

6.0 Biodynamic Agriculture

This is another form of "organic farming" that was developed from a series of eight lectures on agriculture delivered in 1924 by Austrian Rudolf Steiner (1861–1925), who is the founder of "anthroposophy". The lectures seek to proffer solution to the depleting nature of the soil which ultimately resulted in poor quality crop and animal health. Steiner believed that a renewal in agriculture was necessary so as to re-invigorate the earth. Like organic farming, biodynamic agriculture sees the farm as a living organism interacting with its environment to build healthy soil and nutritious food that will sustains plants, animals and eventually humankind. Emphasis is placed on the integration of crops and livestock, the recycling of nutrients, and the health and wellbeing of crops and animals. The farmer stands central in the biodynamic agriculture.

7.0 Challenges in Developing Organic Animal Production

Although many countries of the world are seriously making frantic efforts to boost organic animal agriculture and organic crop farming especially in the area of commercially valued crops; very serious bottlenecks are posing restrictions to its growth and development. Prominent among these challenges are as follows:

- lack of technical knowhow
- small-scale farm holdings
- poor quality of grasses
- problems in animal feeding
- sanitary regulations
- incidence of pest and diseases
- insufficient training and certification facilities.

7.1 Lack of technical knowledge

Most farmers do not have the technical expertise needed to carry out organic animal agriculture. There is inadequate awareness on organic production practices, animal welfare matters and those requirements of importing countries, especially by individual organic trainers/advisers and farmers. Organic production exercise requires an in-depth understanding concerning the principles, standards, production practices and requirements of the organic certification agencies of various networks. Educational workshops, seminars, symposiums and other enlightenment trainings are rarely organized for organic farmers and where it is organized, attendance are

usually poor. Where there is available literature on organic farming, it usually comes in English, print medium and the internet that these farmers may not have the convenience to go through them. Also, accessibility of these materials pose another form of challenge to small-scale farmers who are predominantly semi-literate or completely illiterate.

7.2 Small-scale farms holdings

In most countries of the world, especially in Africa and Asia, small-scale farmer holders depend on animal production as a means of their livelihood. Small farms are generally not suitable for the development of organic animal production, especially for exportations. The implication of small farms is low production (turn out), lack of processing infrastructure which may result in eventual poor quality of products. The production of milk from dairy animals is typically within the domain of small-scale producers that produces in small volumes. Dilution, contamination and traceability are common problems with these small-scale farmers. To address this challenge, technical and policy interventions are important. Successive governments must make policies that will support added-value initiatives and product marketing to help make the small farm production system more sustainable. Credit facilities, subsidies, various vital goods and services, insurance and improved technologies, must be made available to small scale farmers to improve the efficiency (FAO, 2007).

7.3 Problems in Animal Feeding

The importance of feed in animal production could be seen from the angle that it accounts for about 55-75% of the production cost in non-ruminant animals. Faulty/poor feed and feeding has been implicated for many production problems such as infant mortality, poor growth, poor quality produce and low income. In non-ruminant animals, the gastro intestinal tract impose certain nutritional limitations that must be taken into consideration if the best is to be obtained from them. These include the need for readily digestible feed arising from their inability to utilize complex carbohydrates, cellulose and hemicelluloses. They need essential amino acids hence they cannot synthesize amino acids. The appropriate processing of feed ingredients to be used in feed formulation is also vital in ensuring that the animals are able to readily digest the feed. In many parts of Europe, livestock feeding has been a matter of serious controversy. The USDA has published new regulations addressing the use of pastures in organic livestock production. The rules seek to strengthen the existing standards and clarify the USDA's emphasis on pasture-based animal production for producers, consumers and certifiers. The regulation requires that 'animals (ruminants) must obtain at least 30% dry matter intake from grazing pasture during the grazing season'. The implication is that pastures require to be properly managed so as to make significant nutrient contribution. In addition, further requirements are being placed on pasture quality. For example, EU regulations require that pastures be suitable for the natural nutritional and behavioral needs of species of some farm animals.

7.4 High Cost Animal and Plant Organic Products.

Prices for organically produced foods (animals/byproducts and plants/ byproducts), tend to reflect many of the costs as conventional foods in term of growing, harvesting, transportation and storage. Organic foods must meet strict regulations (certification), and intensive management and this why the farming is mostly done on a smaller scale. Organic farming is still faced with the problem of higher labor input/cost in its operation. For this reason Pandel and Lampkin (1994), noted that the labor input measured in terms of either hours of work or full–time job is usually greater on organic than on equivalent conventional farms. Also, organic farming require more labor to carry out manual and mechanical tasks needed for production. The preparation for sale on the farm or on the market also involves more labor on organic holdings (Patrik and Alain, 1999).

7.5 Incidence of Pest and Diseases

The incidence of pest and infectious/zoonotic diseases is another serious bottleneck that is adversely affecting the production the organic animals, crops and trading in livestock products. Some of these farm animal diseases are endemic and as such pose serious challenge to their production. This will negate the principle of animal health conditions are needed, in organic livestock production. Foot and mouth disease (FMD), swine fever and Rift Valley fever restrict exports from much of the developing world. The control of these diseases should be a high priority for these countries where they are prevalent. Affected countries can create disease-free zones, in which organic animal production can be carried out in sustained manner. In animal production, there is great focus on preventing health problems and diseases through better management practices.

7.6 Insufficient Training and Certification Facilities.

Harnessing the full potential benefits of organic farming will require the training of both trainers/advisers and farmers in organic production practices. Various levels of governments may consider sponsoring certification to encourage environmentally friendly production. Small-farm holders in the tropics may find it difficult to pay for mandatory inspections which are often carried out by foreign certification agencies or through their affiliates in producing countries thereby deterring many farmers from switching over to organic production. In addition to these problems, organic livestock production is not yet developed in many other nations owing to lack of organic feed and pastures. Limited amounts of certified organic animal products, mainly poultry and pork, are available in some domestic markets. Certification requirements appeared to be so stringent that the first organic Japan Agricultural Standard (JAS) certified beef sold in Japan reportedly came from an Australian operation in 2008.

8.0 Prospects of Organic Animal Agriculture

In spite of the strong growth in demand for organic meat and dairy products, a number of instances exist where supply has exceeded demand thereby resulting in either a severe reduction in the price difference between organic and conventional products or organic products being sold as conventional products. In the face of so many other teething challenges, the prospect of a successful export

industry is the major motivating factor in the development and growth of organic farming in most developing countries. These countries may have impressive livestock strength and other factors in their favor, yet the international trade in livestock from the developing world is a risky business, as far as organic livestock products are concerned (F.A.O, 2002 and Harris *et al*., 2003). There are strong reasons for countries to focus on organic livestock production. Some of these encouraging factors are:

- demand for organic livestock products is growing across the globe;
- the EU is a net importer of organic beef, sheep and goat meat;
- consumers pay a large price premium for organic food in countries of the world;
- some developing countries are successfully exporting livestock products to developed countries;
- in 2001, 16% of broiler meat and 40% of beef imported into the UK came from developing countries, such as Argentina and Brazil, that export organic livestock products to the EU (Harris *et al*., 2003);
- India and Nepal currently export certified organic honey, as do some African countries, sourced mostly from forests and small-scale producers. Organic honey is a good entry point to focus on, along with small ruminants, when developing organic livestock production in developing countries;
- the use of agrochemicals is almost nil in large parts of India and Nepal, and this is ideal for developing organic livestock production;
- native breeds of livestock, which predominate in tropical countries, are less susceptible to stress and disease, and so the need for allopathic medicines and antibiotics is much lower;
- the grass-based, extensive production systems and forest-based, animal production systems that are prevalent in many areas of these countries have considerable potential for conversion into organic animal husbandry.

9.0 Conclusion

Animal production has undergone tremendous transformation from right from the time of the early men to a more sophisticated enterprise that has caught the attention of successive governments across the globe. Tropical countries have some natural advantages when it comes to organic livestock farming, which could be harnessed to boost organic livestock production for domestic consumption. To benefit maximally from this emerging system of animal food production, producers, policy formulators and other critical stakeholders in developing countries must build their capacity and take into cognizance of their natural advantages.

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