

Organic animal husbandry: concept, status and possibilities in India—A review

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Accepted: 28 November 2005

ABSTRACT

The animal production system, may be broadly classified as traditional, conventional and organic with their distinct characteristics. While traditional and conventional production systems are well established and their respective features known widely, the organic animal husbandry system has emerged only recently, which is still evolving. Many believe that the organic animal husbandry is same as traditional animal husbandry practiced in India since centuries, which, of course, it is not. The organic animal husbandry is far more sophisticated and knowledge intensive system of animal production meant to safeguard not only the human health but also the welfare of animals and the environment on the whole. Thus, it is important to develop correct understanding of the organic farming and especially the organic animal husbandry *per se*. This review, therefore, has attempted not only to define the organic farming and organic animal husbandry production system, and progress made around the world in this front, but also explored the opportunities for India in this regard.

Key words: Animal husbandry, Organic animal husbandry, Status

'Organic' is almost a buzzword now to signify something "natural" and inherently good, often used carelessly without knowing much about the very essence of organic farming *per se*. Organic farming has a very strict definition: it denotes farming systems that adhere to the standards of organic farming (Lund 2005). As the word 'organic' is becoming popular by the day, it is important to spread correct awareness about it so that at least the stakeholders in particular understand it in right perspectives. Organic agriculture has been defined and explained in many ways but all converge to state that it is a system that relies on ecosystem management rather than external agricultural inputs. It is a system that begins to consider potential environmental and social impacts by eliminating the use of synthetic inputs, such as synthetic fertilizers and pesticides, veterinary drugs, genetically modified seeds and breeds, preservatives, additives and irradiation. These are replaced with site-specific management practices that maintain and increase long-term soil fertility and prevent pest and diseases (FAO 2005).

FAO/WHO Codex Alimentarius Commission defines organic farming as "a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasises the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems".

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This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfill any specific function within the system. The primary goal of organic agriculture is to optimize the health and productivity of interdependent communities of soil life, plants and people . . . [where] systems are based on specific and precise standard of production which aim at achieving optimal agro ecosystems which are socially, ecologically and economically sustainable. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfill any specific function within the system.

According to Soil Association (UK), organic farming is an agricultural system that encompasses: management practices which sustain soil health and fertility; the use of natural methods of pest, disease and weed control; high standards of animal welfare; low levels of environmental pollution; enhancement of the landscape, wildlife and wildlife habitat; and the prohibition of all genetically engineered food and products. Organic farming is an integrated system of farming based on ecological principles. It promotes biodiversity, biological cycles and soil biological activity. Organic farming uses environmentally friendly methods of crop and livestock production, without use of synthetic fertilizers, growth hormones, growth enhancing antibiotics, synthetic pesticides or gene manipulation.

Organic production systems, unlike traditional systems of production, are governed by a set of standards to be

followed strictly by the producers of organic food. Compliance with these standards is verified by certification agencies authorized by the respective governments. A farm may be classified as organic if it meets the criteria stipulated in a set of guidelines known as organic standards. The quality of production under organic management is ensured through certification procedures using internationally acceptable standards for organic production. Organic certification guarantees not only the quality of the product but also the quality of production. This more than often appeals to the consumers. In conventional products, there is no way to guarantee the production procedure, but, in organic farming, production procedure is certified to be safe and sound as well as environment friendly.

'Organic' in organic agriculture is a labelling term that denotes products that have been produced in accordance with certain standards during food production, handling, processing and marketing stages, and certified by a duly constituted certification body or authority. The organic label is, therefore, a process claim rather than a product claim. It should not necessarily be interpreted to mean that the foods produced are healthier, safer or all natural. It simply means that the products follow the defined standard of production and handling, although surveys indicate that consumers consider the organic label as an indication of purity and careful handling. Organic standard will not exempt producers and processors from compliance with general regularity requirements such as food safety regulations, pesticide registrations, general food and nutrition labelling rules, etc. (FAO 2000).

The basic principles and standards for organic farming are formulated by the International Federation of Organic Agriculture Movements (IFOAM), which is an umbrella organization covering groups in more than 100 countries. The basic standards developed by the IFOAM state that one of the basic principles of organic agriculture is "to give all livestock conditions of life with due consideration for the basic aspects of their innate behaviour". Animals have highly developed central nervous systems and behavioural needs, which place an added responsibility on the livestock producer. The production system is not sustainable, if animals show evidence of pain, disease, or distress due to an inadequate system or disharmony between the animals and the system. The need to prevent such situations forms the basis for the concepts of "positive health" and "positive welfare", as introduced in the EU regulation 1804/99, incorporated in EU regulation 2092/91 on organic production (Vaarst *et al.* 2005). The step further is not only to prevent any pain, discomfort, or disease, but also to promote health and well being in each animal as well as on herd level and population level. This is a quality of animal products referring to mode of production, the so called process quality. The philosophy of organic farming emphasizes the need to produce food in an "integrated, humane, environmentally and economically sustainable agricultural production

system". Organic products have characteristics, which distinguish them from conventional farm produces, viz. integrated animal and crop production, safer products devoid of any chemical residues like pesticides, antibiotics, etc., more nutritious and natural products, higher quality, environment friendly and highest regard for human and animal welfare.

Under organic livestock production systems, it is expected that organic meat, poultry and egg products come from farms that have been inspected to verify that they meet rigorous standards which mandate the use of organic feed, prohibit the use of antibiotics, give animals access to outdoor, fresh air and sunlight. The production methods are selected based on criteria that meet all health regulations, work in harmony with the environment, build biological diversity and foster healthy soil and growing conditions. Market animals that were raised without use of toxic persistent pesticides, antibiotics and paraciticides (Borell and Sorensen 2004). Animal health, well being, better living conditions, welfare measures, feeding practices are to be ensured through a set of standards and maintenance of written records by the organic livestock farmers. Better managerial practices and prevention are emphasized over treatment. Thus, the primary characteristics of organic livestock production system are: a defined standard; greater attention to animal welfare; no routine use of growth promoters, animal offal or any other additives; at least 80% of feed grown according to organic standards, without the use of artificial fertilizers or pesticides on the crops or grass. To be precise, organic meat, milk and eggs means that are produced, harvested, preserved and processed as per organic standards.

Livestock plays an important role in relation to the general principles of organic agriculture, supporting biological cycles within the farming system and diversifying production (Hermansen 2003). Consumers buy meat and milk products to experience direct qualities, such as taste, nutritive value, and food safety, but also to benefit from indirect qualities, which are linked to the production process. They expect animals to be treated with compassion and to a high level regarding their welfare, and that production has been carried out in an environmentally friendly manner (Sorensen and Jakobsen 2005).

The concept of organic livestock production gained momentum recently in developed countries because of concerns for animal welfare, chemical residues, incidence of bovine spongiform encephalopathy (BSE), foot-and-mouth disease (FMD), genetically modified food (GMF) and some bacterial diseases. The affluent sections in developing countries too are influenced by these concerns and this stratum of society may increasingly look for organic livestock products fuelling the demand of organic food products in developing countries too. Moreover, the organic farming is considered to be more sustainable than the input intensive conventional systems of crop and livestock production.

Therefore, whether one likes it or not, organic farming is rapidly expanding world over. There may be critics especially in developing countries where chronic food shortages are still common but organic is a growing reality, it is happening everywhere with the support of Non-Governmental Organizations (NGOs), private sector and also the government agencies.

According to Sundrum (2001), organic farming is not a production method to solve all problems in livestock production. It is primarily a production method for a specific premium market with high requirements for the quality of the production process, demanding high management qualification. For the development of organic livestock farming, it is important to ensure the confidence of the consumers in organic products by realizing the self created demands to a high degree. Therefore, organic farming is a challenge not only for the farmer but also for agricultural research and interdisciplinary work. The countries that have accepted this challenge have progressed even in developing country circumstances. The Latin American countries, like Argentina, Brazil and Uruguay produce substantial amounts of organic meat (ITC 1999). In Argentina, more than 1 million ha of land is dedicated to organic livestock production, the majority of which produce organic beef cattle and 80% of the produce is exported to the EU. In Brazil too organic beef, poultry, egg and milk production is increasing (USDA 2001). The organic dairy and meat products are now increasingly available in markets in EU, USA, New Zealand, Australia, Japan, Argentina, Brazil and some other countries. This trend on livestock products may further expand in other Asian and African countries where organic agro products have already entered into market. For instance, organic spices, pulses, rice etc. is now available in market in Indian metros and several other Asian countries.

To remain relevant to the global economy, the developing countries too have to produce what the consumers are demanding globally. Therefore, it is a necessity to focus attention on this system of production. India certainly needs to move forward with its organic farming activities, if not in big way, certainly small steps are essentially needed. This is what is rightly happening in India currently in case of high value commercial crops. A beginning has to be made in the area of organic animal husbandry as well through systematic efforts made in a network mode drawing expertise from the different quarters. There is a strong possibility that India will be able to produce organic livestock products for not only its domestic consumers but also for the consumers elsewhere in the world, given the vast pool of resources including the technical and scientific manpower India has. Some South East Asian countries especially Malaysia and Thailand have already initiated research and development work in the area of organic animal husbandry, which deserve appreciation, and in fact may guide and show the path to other developing countries in the region.

Organic certification standards

The standards for organic production are basic requirement for organic production of crops, livestock, fisheries etc. since the production has to be in accordance to these standards. The certification bodies monitor the adherence to these standards by the organic producers. Therefore, most of the countries have national certifying body or agencies that certify the production management system as organic. Without their certification, products cannot reach the consumers as organic. A lot many organic standards exist at present. But, mainly 5 standards are important and have worldwide acceptance, viz. EU regulation (1804/1999), Organic Food Products Act (OFPA) of USA, Draft Guidelines of Codex/WHO/FAO, UKROFS of UK and the IFOAM Basic Standards. Considering the regional importance, the Government of India (GOI) too has developed Indian National Standards for Organic Production (NSOP). These standards are published (NPOP 2002) under the National Programme for Organic Production by the Agricultural and Processed Food Products Export Development Authority (APEDA).

In European Union (EU), majority of the countries have their own certifying standards and agencies. To avoid confusion of having a number of standards and certifying bodies, the first regulation on organic farming [Regulation EEC 2092/91] was drawn up in 1991 and, implemented in 1992 to supplement the various organic standards of different EU nations. Again in July 1999, the EU adopted the EU regulation (1804/1999) and implemented in August 2000, which amends regulation 2092/91 with regard to livestock production (Schmid 2000). They are direct production standards with the aim of equalizing market in EU and have the status of law. The EU organic standards are far stricter, often hampering the prospects of exports to these countries. Thus, it is important to have understanding of the standards of not only the one's own country but also of other countries especially those where one wish to export the organic agricultural products.

In USA too, a large number of standards existed till recent past, which created a lot of confusion among the organic producers. To avoid these, United States Department of Agriculture (USDA) came up with Organic Food Production Act (OFPA) – 7 CFR 205, by combining 44 prevalent organic standards. The USDA standards were proposed in March 2000 (Tomahawk and Honeyman 2000). Codex Alimentarius Commission (CAC) and World Health Organization (WHO) has come up with another set of organic standards – Draft guidelines for the Production, Processing, Labeling and Marketing of Organically Produced Foods. It does not certify but provides guidelines for developing organic standards to certifying bodies.

International Federation of Organic Agriculture Movements (IFOAM) has a set of standards of its own, known as 'IFOAM Basic Standards', and it is trying to

establish a worldwide common set of standards. IFOAM Basic Standards were proposed in 1997 and adopted in December 1998 and further modified in 2000. This is a worldwide standard for standards, which guides others and have a strong impact on national standards including in India. The IFOAM Basic Standards for organic agriculture and food processing (IFOAM 2002) are the most commonly used organic standards around the world, which have been now translated into 18 languages. The first IFOAM basic standards were introduced in 1980. The IFOAM basic standards provide the framework for national or regional certification and inspection organizations that adopt their own standards within the framework set by the basic standards. Recognizing the importance of organic agriculture, the Food and Agriculture Organization (FAO) of United Nations too have taken a number of initiatives to promote organic agriculture around the world. The FAO/WHO adopted guidelines (Codex Alimentarius) for organic plant production in 1999 and for livestock in 2001 (FAO 2001). The contents of IFOAM and Codex standards are more general, outlining principles and criteria that need to be fulfilled, and less detailed than the regulations dealing specifically with European context. Although the philosophy behind these standards is the same, they differ in some criteria like conversion period, feeding, and veterinary treatment.

The standards for animal health and welfare in organic farming in the UK are set out by UK Register of Organic Food Standards (UKROFS) and the Soil Association. These standards state "the objective of organic agriculture is to sustain animals in good health by the adoption of effective management practices, including high standards of animal welfare, appropriate diets and good stockmanship". Among Asian countries, Japan was the pioneer to set an organic standard of its own. In April of 2001, amendments to Japan Agricultural Standard (JAS) regulations came into force and an organic food product inspection and certification system compliant with international standards was created. The new regulations specify that only products conforming to specific JAS standards for organic agricultural products and for organic agricultural product processed foods are eligible to display the "organic" JAS symbol. Weinberg (2002) studied the JAS and reported that JAS rules took a fundamentally different approach from those of the other standards. Instead of the process of organic production and handling, the JAS rules focus on the moment in which the JAS seal is affixed to the product and on the qualifications of the official "Grading Manager" responsible for reviewing the audit trail and thus, ensuring JAS compliance.

In India, in 2000, the National Programme for Organic Production (NPOP) was launched (formally unveiled in May 2002) and in May 2001, the National Accreditation programme was notified by the Ministry of Commerce. APEDA, Tea Board, Coffee Board and Spices Board have been designated as the accreditation agencies (NPOP 2002).

In every sense, the National Standards for Organic Production (NSOP) in India, are largely based on the IFOAM Basic Standards. These standards need to be discussed by the stakeholders at different levels for periodic changes and modifications as per the local situations. The Indian Standards for Organic Animal Husbandry, for instance, were discussed during the National Workshop on Organic Animal Husbandry Standards held at the Indian Veterinary Research Institute (IVRI) on November 26–27, 2002 (Chander 2002, 2004). More such efforts are needed, as the awareness about the NSOP and NPOP is still very low especially in context of the organic animal husbandry. The academician and researchers may play a vital role in raising the awareness among the farmers, who may have to venture into organic production sooner or later due to growing demand (Chander 1996).

The stakeholders especially the researchers, academicians, trainers, farmers and traders are expected to refer to IFOAM Basic Standards as well as the Indian National Standards for Organic Production for an informed discussion and practice of organic farming. This is one serious problem that many enter into discussion on organic farming without any proper knowledge of these standards. Most of such discussions currently are governed more by emotions devoid of factual knowledge. It is a question of credibility of organic agricultural products that inspection and certification of these products has importance so as to guarantee quality organic food to the consumers who may be living far away from the production site. Many find it complicated and dismiss such complex procedures and requirements but it has to be seen that consumers want quality assurance particularly when they pay better price for such products. This is what also differentiates the organic products from the conventional and traditionally produced agro products.

In organic food products, not only the product quality but also the process quality is important. The entire production, processing and marketing practices are subject to inspection. The traditional farming practices including animal husbandry practiced in India may be very close to the organic farming, not by the conscious choice of the farmers but by default yet the products from such production systems may not qualify to be considered as 'organic', for the want of adherence to the basic standards. Nevertheless, such traditional production systems with low to negligible use of chemical inputs are ideal for conversion to organic farming in comparison to the input intensive conventional production systems. This is where lies the opportunity for India to benefit from its traditional production systems, which are not yet much contaminated with the chemical fertilizers, pesticides, antibiotics and other hazardous chemicals. The fertilizer and pesticides consumption in India is well below the world averages. Manual weeding is a practice still followed in different parts of the country. Cheap and easy availability of labour also suits India to the labour intensive organic cultivation.

Advantages and limitations of organic livestock production

Organic food products are generally considered to be of better quality due to strict compliance of quality enhancing measures. Yet, the organic livestock products are not completely free from criticism in quality front. Some of the reported benefits as also the limitations (Kondaiah and Mendiratta 2002, Patahk *et al.* 2003) of organic livestock production are: (a) it ensures strict animal welfare measures; (b) recognize animal comfort and animal behaviour; (c) it is better for environment; (d) better sustainability of production; (e) continuation of traditions and culture; (f) boost to traditional technologies; (g) it is 'safer' (antibiotic/chemical/drug/pesticide free); (h) it has better protein quality (proteins of organic pork are less denatured than those of traditional pork during cooking); (i) it has lower content of carcinogenic nitrogen, thus, reduces carcinogenic problems; (j) organic meat taste equal to or better than traditional meat; (k) veterinary costs are generally significantly lower on organic farms than conventional farm; (l) less importance on high live weight gains facilitate crossing breeds with higher intramuscular fat in meat for better relish when eaten; (m) greater motion reduced abdominal fat and favoured muscle mass development in broilers; (n) motor activity increased breast percentage in chicken; (o) motor activity favours myogenesis against lipogenesis; (p) lower pH in organic meat due to better welfare and reduced pre-slaughter stress and thus, reduced consumption of glycogen; and (q) no drug or antibiotic residue in milk and meat.

Alongside the advantages, there are certain limiting implications associated with a shift to organic livestock production, viz. (a) it is practically difficult to provide a large locomotion area as prescribed in EEC-Regulation on organic livestock farming eg 6.0 m² indoors + 4.5 m² outdoors for dairy cows; 1.5 m² indoors + 1.1 m² outdoors for calves; 1.3 m² indoors + 1.0 m² outdoors for fattening pigs and 1 600 cm² indoors + 4 m² outdoors for laying hens (Sundrum 2001); (b) prolonged withdrawal period required after any veterinary treatment with drugs, make farmers reluctant to call a veterinary surgeon, reaching to a delay in the treatment of sick animals and a deterioration in animal welfare; (c) processing or preservation of meat and meat products is difficult without use of certain chemicals eg. trisodium polyphosphate, sodium nitrate; (d) blanket rejection of preservatives may have serious effect on food supply and safety of foods; (e) organic farming may interfere with optimum land use on farms; (f) organic milk and meat production may further decrease the availability of milk and meat; and (g) cost of production of organic meat is very high. It has been reported that cost of production of organic pig is 85.2% higher compared to conventional production system. This increase in production cost was attributed mainly to increase in housing area (Lauritsen 2000). Owing to these limitations, organic farming is often criticized and questioned in developing country context, where there is already a shortage of foods.

Indian Livestock sector: Potential for growth

India has to feed its 1.03 billion people (16% of the world's population) from 2.3% of the global landmass and 4.2% of world's water resources. Most of the net sown area (65%) is rainfed, which contributes only 35% of the food production. Indian economy is increasingly looking forward to its livestock sector for growth (Birthal and Jha 2005), since India owns 11% of the world's livestock. Indian livestock sector is vibrant with high potential for growth including for the development of organic animal husbandry due to certain favourable features (Table 1). Livestock in India are raised largely under low input low output subsistence farming conditions, resulting in very low productivity. Considering the natural advantages India has in conversion to organic farming, organic livestock production may offer an opportunity? Thus, the prospects of organic milk and meat production in India are good (Chander 2005).

Organic agriculture scenario in India: Some milestones

Organic agriculture is one of the fastest growing sectors of agricultural production in the world. The global market for organic food products is about US\$ 26 billion and it is further expanding rapidly with annual increase of about 20–25%. In 2004, controlled organic farming took place in about 100 countries world wide on 26.3 million ha of land (Willer and Yussefi 2004). With increasing concern for environment and rising consumer awareness about safe and quality foods, the organic foods are attracting ever increasing number of consumers. Its simple economic function of demand and supply, i.e. more demand means pressure for increased supply of such foods, which has to be ensured either through domestic production or importing from countries producing such foods to cater to the needs of consumers.

Considering the potential environmental benefits of organic production and its compatibility with integrated agricultural approaches to rural development, organic agriculture may be considered as a development vehicle for developing countries like India, in particular (Ramesh *et al.* 2005). Therefore, the GOI has also taken initiatives to boost organic agricultural production in the country by taking appropriate steps (Table 2). Most of these developments concern high value crops like tea, coffee, spices, cotton, *Basmati* rice etc. Ramesh *et al.* (2005) have concluded that large-scale conversion to organic agriculture would result in food shortage with the present state of knowledge and technology, as the yield reductions of organic systems relative to conventional agriculture average 10–15%, especially in intensive farming systems. But, in traditional rain-fed agriculture, organic farming has the potential to increase the yield, since 70% of total cultivable land falls in this category. Mere 5–10% increase in farm production would definitely help achieve the targetted growth rate of 4–5% in agricultural production in the Tenth Plan period.

The organic animal husbandry *per se* has not yet taken

Table 1. Favourable features for organic animal husbandry development in India

S.No	Features favourable to animal husbandry development in India
1.	Crop- livestock integrated/mixed farming system. The requirements of fodder and feed are met on-farm. The dependence on market for external inputs is reduced to minimum. Under organic production management externally purchased inputs are discouraged. Indian traditional animal husbandry system has potential for conversion to organic animal husbandry system.
2.	Largest livestock (450 million), poultry population (489 million) and number one milk producer in the world. Livestock sector produced 88 million tonnes of milk, 40.4 billion eggs, 48.5million kgs of wool, and 6 million tonnes of meat in 2003-04. In 2003-04, India exported agro products of value US\$ 3252.43 million, out of which US\$377.66million (12%) were earned through export of meat products. The total export earnings from livestock, poultry and related products was US\$1080.82 million in 2003-04, out of which leather accounted for 54.24% and meat & meat products accounted for 35.78%. Some proportion of this vast sector may be developed as organic in the areas, where, it is comparatively easy to convert to organic farming.
3.	In India native breeds are well adapted to local situations. Being hardy, resistant to diseases, health and maintenance cost is very low.
4.	The GOI is strongly committed to animal disease control and eradication. Rinderpest (RP) is not reported in India since 1995, OIE has declared it free from RP. Foot & Mouth Disease (FMD) control programme is being implemented aggressively. India never had BSE, Bird Flu and many infectious diseases are not reported in India in last 10 years. The more controlled animal health environment is needed for the organic animal husbandry. The Indian native livestock breeds are less susceptible to diseases and stress, thus, ideally suited for the organic animal production.
5.	Existing extensive livestock production systems are easier for conversion to organic production. The areas with low to negligible external input use like remote hilly terrains, tribal areas and certain north eastern states have favourable conditions for the development of organic farming.
6.	Small animals like goat, sheep, pigs, and rabbits may make good beginning in organic meat and leather production. Also, domestic market for organic milk and milk products viz. <i>ghee</i> can be developed with ease. Organic leather could be a valuable export commodity from India. Backyard poultry systems with indigenous breeds have potential for organic poultry production. Some consumers prefer milk, meat and eggs from native breeds for which they pay even premium prices readily.
7.	Unlike in western developed countries, where, specialized farming is common, farms in India are mostly diversified in term of crops grown, species and breeds of livestock raised. On-farm diversity is considered good for the organic farming.

Table 2. Organic agriculture scenario in India: Some milestones

S.No.	Development Indicators	Remark
1.	National Programme of Organic Production (NPOP) launched	2000 (Formally unveiled in 2002)
2.	Indian National Standards for Organic Production (NSOP) developed and published	2001, revised edition available since 2002
3.	National Centre for Organic Farming established	2003
4.	Total area under certified organic cultivation	*25,08,826 ha (This includes wild herbs collection from forest area of 24,32,500 ha) of Madhya Pradesh and Uttar Pradesh
5.	Total organic agricultural products produced	*1,19,656 tonnes + 16,57,000 nos. of seedlings and cuttings + 2,64,000 litres of effective micro organisms
6.	Number of items exported	*31
7.	Total quantity exported	*6,792 tonnes
8.	Value of the organic agricultural products exported	*Rs 7123 Lakhs
9.	X plan outlay for organic farming development	Rs 100 crore (US\$ 22 million)
10.	Organic projects in India	Implemented by Government, NGOs, private sector
11.	Government policies	Favourable to organic farming
12.	NGOs and Private sector	Playing proactive role in organic farming development
13.	Organic farming and ICAR	A Network project on organic farming sanctioned by ICAR (2004-07) involving 4 ICAR institutes and 9 SAUs with a budgetary provision of Rs 28.30 million as an integrated part of ICAR's on going project on 'AICRP on cropping systems'. The North-eastern region and other dryland areas are particularly being targeted for the research and development activities relating to organic farming.

*National Programme for Organic Production (NPOP), APEDA, 2005.

off in India though animals are central to organic farming. Some of the issues concerning organic farming in general in India (Chander 1996, Chander 1996a, Chander and Tiwari 1997, Sharma 2001, Ramesh *et al.* 2005 and Prasad 2005) and more specifically the organic animal husbandry have been highlighted by the authors elsewhere (Chander and Kumar 1999, Chander 2001, Samajdar and Chander 2001, Chander 2002, Pathak 2002, Shah 2002, Pathak *et al.* 2003, Chander 2004, Chander 2004a and Chander 2005). However, the practical experiences of organic animal husbandry *per se* are not yet available to quote though some Non-Governmental Organizations, religious and animal welfare trusts have attempted to set up dairy farms in India with emphasis on organic practices.

A review of the situation reveal that India may not be in position to export organic livestock products at the moment but the people from higher strata within the country may increasingly look for products from organically raised livestock. High consumption of meat and milk products in developed countries (where demand for organic food too is high), a large number of technical manpower available in India, availability of world class meat and milk products processing facilities, increasing support for organic farming through suitable interventions, rising consumer awareness, increasing concern for environment and animal welfare issues indicate opportunities for the growth of organic livestock production.

Problems in development of organic animal husbandry

While India is making concerted efforts to boost organic production especially of the high value commercial crops but the problems too are very serious restricting growth in organic farming. Some of the potential obstacles especially in context of the exports of livestock products are: (i) Sanitary regulation: Only a few developing countries are able to export even the conventional livestock products due to strict sanitary requirements imposed by importing countries. These sanitary regulations are further strictly monitored in case of organic livestock products. The GOI is taking initiatives in this regard by emphasizing the Clean Milk Production (CMP), Good Manufacturing Practices (GMP), HACCP, ISO certification, best practices etc. These efforts would need to be further pursued strongly so as to improve access to international market for the Indian organic livestock products. This may be difficult but not impossible especially when some of the developing countries like Argentina and Brazil export organic livestock products to EU. The efforts are needed on massive scale to improve hygiene and sanitary conditions especially at production, processing and packaging stages. (ii) Traceability: Importing countries emphasize farm to table traceability and there is an increasing attention on this in recent times. It may be comparatively easy to trace the origin of products in western countries, where farms are large with high volumes of production per farm. In Indian conditions,

where, milk and meat is sourced from numerous small farmers, the traceability may be a difficult option. The cost effective traceability tools suitable to Indian farming conditions and acceptable to importing countries will have to be developed. (iii) Existence of diseases: Prevalence of infectious/ zoonotic diseases also adversely affects trade in livestock products. More controlled animal health environment is needed especially in case of organic livestock production. Thus, FMD control is number one priority for India. The Diseases Free Zones (DFZs) may be created, where; organic livestock production may be encouraged. (iv) Small Farms: In India, livestock production is mainstay of landless and small scale farmers. However, the landless animal husbandry is not allowed under the organic systems of livestock production. Whereas, over 80% holdings are < 2 ha. The small farms are not suitable for the development of organic livestock production especially for the exports. The small farms means small volumes coupled with lack of processing infrastructure, results into poor quality. Milk production in India is largely under the domain of small producers producing small volumes, where, dilution, contamination and traceability are some common problems. Therefore, interventions, both technical and policy are critical including developing linkages to support value addition and marketing of products to ensure making small farm production system highly sustainable. Services and goods including credit and insurance and improved technologies need to be made available to improve efficiency of small farm producers (Taneja 2005). Contract farming may be a potential solution where many small farmers may contract out their farms to companies, which may produce organic food products on consolidated holdings. The contract farming may be mutually beneficial and organic farming would be easier to pursue under such arrangements for the obvious reasons. (v) Lack of knowledge: The awareness about the organic production practices, animal welfare issues and requirements of importing countries is inadequate especially at the level of trainers and farmers. Whereas, the organic production calls for an in-depth understanding of the principles, standards, production practices and requirements of the organic certification agencies. Most of the literature relating to organic farming is available in English through print medium and Internet, which are hardly accessible to small scale farmers. (vi) Lack of training and certification facilities: Locally available training and certification facilities at an affordable cost to small farmers is yet not much available. Indian small farmers may find it difficult to pay for the mandatory inspection often done by the foreign certification agencies through their affiliates in India. This may deter many Indian farmers to switch over to organic production especially when there is a weak domestic market and current poor prospects for exports in livestock products. Training for the trainers and farmers on organic production practices is essential to harness the potential of organic

farming. The KVKs may be geared for this purpose. Already some KVKs in Orissa and other states have initiated some work in the area of organic crop production and marketing of organic agro-products including exports (turmeric).

Threats to development of organic animal husbandry

The prospect of exports is the major motivating factor for the development and growth of organic farming in most of the developing countries including India. These countries may have impressive livestock strength and other favourable factors to their advantage yet the international trade in livestock from the developing world is a risky business as far as organic livestock products are concerned (FAO 2002 and Harris *et al.* 2003). An exporter must have an assured certified supply chain to successfully enter international markets. For instance, the need to have a completely organic supply chain could present a problem for export of organic meat from India. Large-scale commercial farms usually undertake most organic livestock production for export; whereas, Indian livestock sector is largely dominated by the small scale producers with little risk bearing ability and resourcelessness. Moreover, the self-sufficiency of organic livestock products in EU may lead to reduced import demand, thus, constraining the growth of organic livestock sector in India. The EU is a net exporter of organic milk, milk products, pork, poultry and eggs. 85% of meat and > 90% of the world's milk trade is between developed countries. The developed countries are very restrictive about imports from the developing countries citing mainly the poor sanitary conditions, poor quality and traceability problems prevailing in these countries. Moreover, the developed countries particularly in Europe have huge food surpluses and farmer subsidy problems. Thus, only a handful of developing countries have export potential, including some in South America, Southern Africa (Namibia, Botswana and Zimbabwe) and South East Asia. India will have to make sustained efforts, more than what is being already done in other agro products to make its presence felt in organic livestock production. One way could be to develop organic livestock sector initially for domestic consumption so as to move gradually to organic livestock production for export.

Opportunities for India

The threats apart, there are strong reasons for India to focus attention on organic livestock production. Some of the encouraging factors are: (i) Demand for organic livestock products is growing in the USA, EU, Japan, Argentina and Brazil; (ii) Belgium, Luxembourg, Netherlands and UK import significant proportions of organic produce; (iii) the EU is a net importer of organic beef, sheep and goat meat; (iv) consumers pay a large price premium for organic food in Austria, Belgium, Germany and UK; (v) some developing countries do trade livestock products to developed countries: (vi) in 2001, 16% of broiler

meat and 40% of beef imported to the UK came from developing countries, India may follow the developing countries like Argentina and Brazil that export organic livestock products to EU; (vii) India exported 173 tonnes of certified organic honey in 2001-02, sourced mostly from small scale producers. Organic honey is a good entry point along with small ruminants to focus, for organic livestock production in India; (viii) to begin with, non-food livestock products, viz. organic textile/garments including the materials of animal origin like hides, leather, and wool offer hope for organic livestock production in India. There is a large import of textile raw materials and processed textiles into the UK; a significant proportion comes from developing countries. Current global market trends show a rapid increase in international trade in organic textiles. Therefore, organic leather has potential to be a valuable export commodity from India; (ix) Indigenous Technical Knowledge (ITK) available in India may provide effective substitute to veterinary care; (x) the use of agro-chemicals is almost nil in some parts of India, ideal for the development of organic livestock production; (xi) Indian native livestock are less susceptible to diseases and stress, need for allopathic medicines/antibiotics is very less; (xii) grass based extensive production systems/ forest based animal production prevalent in some parts of India have potential for conversion into organic animal husbandry; (xiii) literacy is on the rise, media is making the consumers aware and concerned about animal welfare issues and health foods- it may boost domestic consumption of organic foods; and (xiv) growing domestic market for organic products in India may help boost organic market at country, and regional level.

Issues for research

While research activities in organic crop production have begun, research relating to organic animal husbandry *per se* is yet to make a beginning in India. There is potential for on-station and on-farm research in all the dimensions of organic livestock production, viz. breeding, feeding, disease control, management, processing, marketing, socio-economic and ethical aspects, it being a virgin area as far as India is concerned. The socio-economic investigations concerning the acceptance of organic livestock production and economics of organic livestock farming may also be taken up by the social scientists engaged in livestock sector. The availability of organic feed and fodder among others may be one big limiting factor in initiating any research programme on organic livestock production since the experimental animals need to be fed at least 80% of the feed and fodder grown organically. The comparative studies on conventional vs organic vs traditional animal husbandry along various dimensions needs to be carried out. Alternatives to conventional treatment methods, viz. plant based products, homeopathy, and other traditional practices need proper

using under organic production systems (Mukherjee and Chander 2005).

Use of agrochemical and veterinary drugs in different agro-climatic zones, may be determined so as to identify the potential areas and species of livestock for organic livestock farming promotion. The location specific organic livestock production demonstration farms need to be established to generate awareness on organic animal husbandry practices. The ICAR institutes, SAUs and KVKs may be best suited for this purpose. A coordinated interdisciplinary project on network mode is urgently needed to initiate research work in the area of organic livestock production. The ICAR has already launched this kind of project with an outlay of Rs 28.30 million, but it is focused on crops (*ICAR Reporter*, July–September 2004). Therefore, a similar project is strongly recommended in the area of organic animal husbandry.

Conclusion

Market for organically produced foods is on the increase world over. The demand for organic products has created new export opportunities for the developing countries. Also, the domestic consumers are now increasingly looking for better quality in food products. The 'organic' is more or less a symbol of purity and quality of food products now, especially when it is certified by the recognized certification agencies. In India, currently 11 certification agencies are accredited by the APEDA for inspection and certification of the organic agricultural products. This means organic farming has to be paid attention to boost organic production to meet the growing demand for such products. Organic farming as per the prescribed standards was being practiced in India only on 4 800 ha in 2003 and the produce exported was valued at about Rs 89 crores, which is only 0.8% of the current global market (Prasad 2005) and it did not have any livestock component except honey (Harris *et al.* 2003). India can greatly benefit from the export of organic foods, but needs to seriously devote attention to market intelligence.

The GOI has rightly considered organic farming as one of the priority area for attention during the X Plan period with substantial outlay. The ICAR has also recognized it as a system of agricultural production worth promotion in certain regions having potential for organic farming. Animals are central to organic farming, and in fact, organic farming is not even possible or sustainable without livestock maintained on the organic holdings. But very little work has so far been done in the area of organic animal husbandry in India. This fact makes it imperative that organic animal husbandry is paid due attention by the policy making bodies, research institutions, the SAUs and other development agencies involved with the R&D work on organic farming. Therefore, appropriate steps are required to be taken urgently towards the development of organic animal husbandry in India.

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