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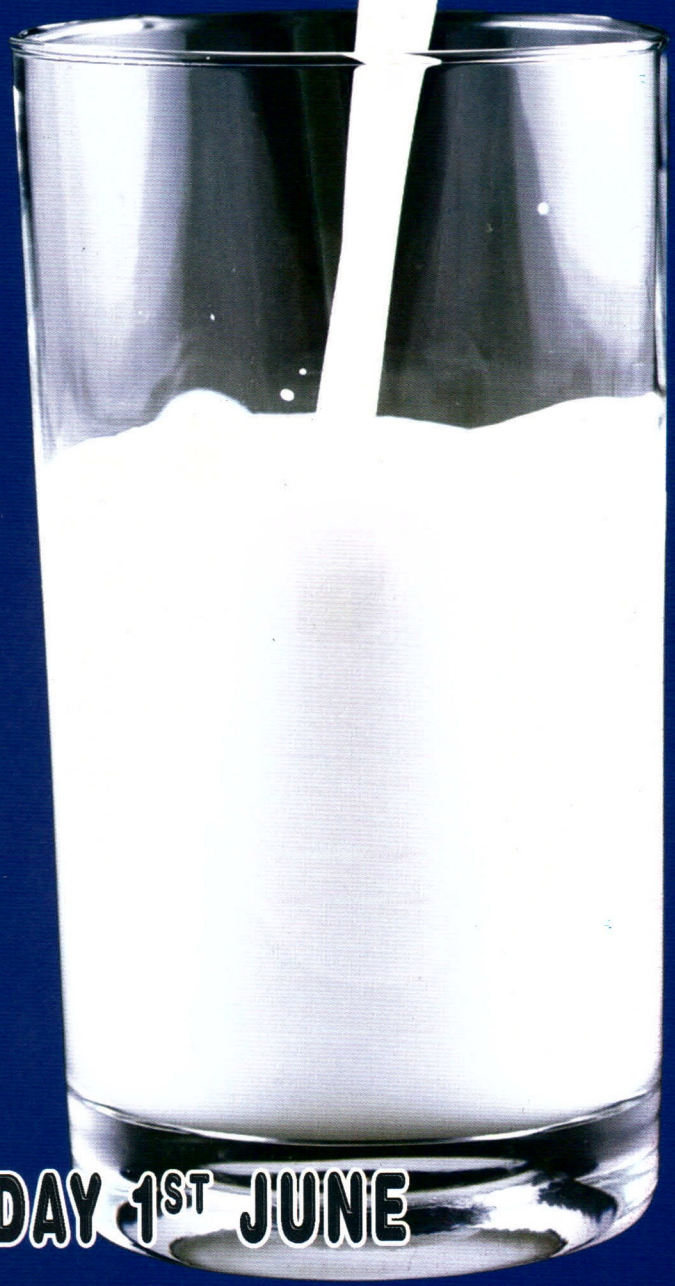
THE SPIRIT OF THE DAIRY INDUSTRY

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Dairy development for food security

ORGANIC DAIRYING
Integrated Organic Farming and Milk Production

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THE SPIRIT OF THE INDIAN DAIRY INDUSTRY

IDA

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INDIAN DAIRYMAN is a specialist monthly magazine dedicated to the dissemination of the latest information, innovations and ideas on the dairy industry so that major players in this field are kept up-to-date. In this way, it acts as a communicator to the dairy industry.

The objective is to provide information service on research, developments and management - crucial factors that affect the dairy industry in the country. The editorial blends essential elements with practical advice to present a comprehensive outlook on all aspects of the industry. The periodical is, thus, a mouthpiece of the Indian Dairy Industry - by you, for you, and of you.

The periodical has become a reference point for anyone attached to this mushrooming industry and is the right medium to reach a focussed audience.

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Integrated Organic Farming and Organic Milk Production: Opportunities and Challenges in India

By
M.S. Mahesh

Introduction

Population growth, increasing urbanization and rising incomes are fuelling a massive increase in demand for food of animal origin (milk, meat and eggs) in developing countries (Das and Santra, 2006). India with its vast livestock population has emerged as the highest annual producer of milk globally. At the same time, an increasing number of people, even in poverty stricken developing countries, are looking for quality, healthy and natural foodstuffs and do not mind paying a little extra for quality assurance (Chander, 2001). In addition, arguments for food that is produced as naturally as possible (organic farming) come primarily from today's consumers organizations worldwide. The organic movement is built on a fundamental principle: *healthy soils lead to healthy crops, healthy animals, healthy humans and a healthy planet.* Organic livestock production is a means of food production with a large number of rules directed towards a high status of animal welfare, care for the environment, restricted use of medical drugs and the production of a healthy product without residues (pesticides or drugs).



Organic farming

Organic farming is native to our country. Sustained agriculture through organic farming in India and China has resulted in them being called as 'farmers of forty centuries' (Ghosh, 1996). Though it started much earlier, it got famous in the 80's (Borell and Sorensen, 2004) when in 1981 organic farmers coordinated internationally and formed a worldwide organization known as International Federation of Organic Agriculture Movements (IFOAM, 2000). This formulated principles and standards for organic farming (Nissen, 2000). Presently, the total area devoted for organic farming in Asia is 2.9 million hectares which represents only 9% of the world's organic agricultural land (Times of India, 2012).

According to codex alimentarius commission guidelines (CAC/GL 32-1999) organic agriculture is defined as "a holistic production management system that promotes and enhances agro-ecosystem health including biodiversity, biological cycles and soil biological activity". Thus it is a form of agriculture which avoids largely the use of synthetic fertilizers, pesticides, plant growth regulators and antibiotic feed additives. Organic farming is a system of production, a set of goal-based regulations that allow farmers to manage their own particular situations individually, while maintaining organic integrity. When

One of the major components of organic agriculture is organic dairy production. Organic dairy farming means raising animals on organic feed (i.e. pastures cultivated without the use of fertilizers or pesticides), having access to pasture, along with the restricted usage of antibiotics and hormones. Organic production emphasises on preserving the fertility of soil, evading pollution, producing food with optimal nutritional quality, reducing the use of non-renewable resources etc. The organic dairy sector continues to be a fast growing segment as organic milk gives a feeling of safety and environmental protection to consumers, and the global demand for organic products is creating a new export opportunity for developing countries.

farming encompasses all the wholesome natural principles, the expected total package of products would be much more than the sum of yields which would be otherwise available. This is because of the symbiotic effect when these principles are allowed to be in operation together. In their joint harness they become more productive (Ghosh, 1996).

There are other terms which are sometimes used synonymously with organic farming (although not exactly the same). These include '*eco-farming*', '*biological farming*', '*bio-dynamic farming*' and '*macro-biotic agriculture*' etc.

One of the major components of organic agriculture is organic dairy production. Though organic production system in agriculture is well known organic dairying and organic livestock husbandry are newer concepts. Organic dairy farming means raising animals on organic feed (i.e. pastures cultivated without the use of fertilizers or pesticides), having access to pasture or outside, along with the restricted usage of antibiotics and hormones (Oruganti, 2011). In other words, it aims at sustaining animal health and production systems in the existing agro-climatic conditions of the country. Products obtained from organic dairy farm are the organic dairy products.

Table 1: Comparison of technical characteristics in organic vs. conventional herds in France (Primiparous Holstein animals)

Parameter	Organic herds	Conventional herds
No. of dairy cows	35	32
Milk (L/ha/year)	5130	7260
FCM/Cow/Year	6000	8900
Concentrate (kg/cow/year)	570	1150
Concentrate (g/kg/milk)	95	128
Feeding cost (Euros/L milk)	19.3	20.4

(Source: Rosati and Aumaitre, 2004)

Organic milk and its quality

Organic milk is defined as the lacteal secretion of the mammary glands being produced by cows reared on a system of inputs with no chemical, pesticide, fungicide, fertilizer and use of allopathic medicines. Although many perceive organic to mean pesticide-free or hormone-free, it in fact refers to management system, not the final product. A comparison of technical characteristics in organic vs. conventional herds is presented in Table 1.



- Organic milk is known to have a lower presence of pesticide residues than conventional milk, although not completely free of these residues

Table 2: EEC-Regulations on organic livestock farming in relation to selected minimal standards

Characteristics	EEC regulations	
	Dairy cow	Calves
Locomotion area per animal	6.0 m^2 indoors + 4.5 m^2 outdoors	1.5 m^2 indoors + 1.1m^2 outdoors
Floor characteristics	Lying space with litter (bedding)	Dry litter bedding
Husbandry practices	Keeping tethered is forbidden	Generally group penning

(Source: Sundrum, 2001)

(Maruejouls and Goulard, 1999).

- Similarly studies of Woese *et al* (1997) demonstrated lesser amounts of aflatoxins M_1 levels in organic milk.
- The level of conjugated linoleic acid (CLA), which is one of the beneficial fatty acids, was 60% higher in organic milk.
- A recent study showed that milk from cows grazing natural grass and clover instead of grain exhibited higher levels of CLA, alpha linoleic acid (ALA), alpha tocopherol (vitamin E) and three carotenoids (beta-carotene, lutein and zeaxanthin) than conventionally reared milk (Deccan Herald, 2008).
- However, no major differences have been established in terms of composition between milk from conventional and organic production (Kouba, 2003).

Principles of organic dairying

Organic dairy production differs from conventional systems. In this regard, European Union has introduced regulations to standardize organic milk production (Goff and Griffiths, 2006). The National Standards for Organic Production developed by Ministry of Commerce and Industry provides guidelines for organic production in India. Some of those relevant to organic dairying are briefed below:

Conversion Period

- Establishment of organic animal husbandry requires an interim period, termed the Conversion Period.
- The whole farm, including livestock should be converted according to the set standards.

With regard to dairy and animal production, the length of conversion period should not be less than 30 days (NPOP, 2000).

Breeds and Breeding

- Breeds should be chosen which are adaptable to local conditions.
- Natural reproduction should be followed — embryo transfer techniques are not allowed.
- Hormonal heat treatments are not allowed.
- Genetically modified organisms (GMO, called 'Excluded methods' in the regulation) are strictly forbidden.

Animal Husbandry Management

- Management techniques in animal husbandry should be governed by the physiological and ethological needs of the farm animal in question.
- Management should ensure sufficient free movement of animals, fresh air and natural day light according to animal needs.
- Ample access to fresh water and feed according to needs of the animal.
- Enough lying and resting area along with natural bedding should be provided if found necessary (Table 2).
- The welfare of the animals must be attended to. Certain surgical procedures like tail docking are prohibited whereas dehorning must be done so as to minimize the stress to the animals (Greene, 2002).
- Landless animal husbandry system should not be allowed.
- An organic farmer must keep sufficient records to verify his/her compliance with the standards.
- Each farm is inspected and audited every year. Any farm can be inspected unannounced at any time.

Animal Nutrition and Feeding

- Cows and calves are fed 100% organic feed.
- At least 50% of the feed shall come from the farm unit itself or shall be produced in cooperation with other organic farm in the region.
- Organic crops, hay, and pasture are grown without the use of synthetic fertilizers and pesticides.
- Non-natural feed additives and supplements such as vitamins and minerals must also be approved for use.
- Organic animals may not be fed any slaughter by-products, urea or manure.
- Calves must be fed organic milk only as synthetic milk replacers are prohibited.

Animal Health and Veterinary Medicines

- Natural medicines and methods, including homeopathy, ayurvedic medicines as well as acupuncture shall be emphasized.
- The use of conventional veterinary medicines are allowed when no other non-allopathic alternative is available and where these are used, the withholding period shall be twice the legally required period.
- The accredited certification programme should make a list of medicines specifying the withdrawal periods.
- Genetically engineered vaccines are prohibited.

Organic dairying: Current status and Opportunities in India

Though there are more than 250,000 organic farms all over the world (Pathak *et al*, 2003), organic dairy farming in India has not yet taken off in a substantial way. A few efforts towards organic dairying in India and recent developments are given below.

- Morraka Foundation (an NGO) started promoting organic farming actively since 1993 with an initial daily procurement of about 5000 L milk from farmers registered as organic crop producers. This milk was being sold in Jaipur at 25-50% higher rate (Rai, 2011).
- Maharastra Organic Farmers Federation (MOFF) has also set up a few organic dairy farms which are producing certified organic milk.
- Uttarakhand is the first state to be declared organic which promoted organic agriculture through creation of nodal agency i.e. Uttarakhand Organic Commodity Board (UOCB) (Subrahmanyeswari and Chander, 2008) which has registered 4459 farms and 790.45 ha of land acquired organic status and 150.94 ha of land is presently under conversion.
- Besides Uttarakhand, Karnataka, Andhra Pradesh, Haryana, Maharashtra and Rajasthan governments have initiated steps for promoting organic farming through the support of NGOs and their departments (The Hindu, 2004).
- Many other commercial organic dairy farms are in the process of being set up in different parts of the country and a sizable quantity of organic milk and some organic milk shall be produced and be available for sale in big cities in the near future (Kamboj and Prasad, 2008).

Converting to organic production may be far easier for Indian farmers as our agro-climatic conditions, diversity and disease resistant native breeds are conducive to it. Thus the cost of organic milk production is expected to be almost equal or slightly higher than the present milk production cost (Kamboj and Prasad, 2008). The rich plant and animal biodiversity with a treasury of traditional indigenous knowledge on non-chemical alternatives to production, offer tremendous opportunities for Indian farmers to become leading suppliers of not only organic dairy products, but also inputs like herbal remedies to fast expanding (with 20-30 % annual growth rate) global market for such products (Mukherjee and Dash, 2001).

Future challenges

The practice of organic dairying in India means to reverse the ongoing trend of using high yielding hybrid seeds, pesticides, chemical fertilizers, crossbred cattle, allopathic medicines, antibiotics and growth promoting feed additives etc. While the growing demands for organic milk offer many opportunities, it is argued that there are also some challenges:

- Certification paperwork and compliance costs are the most challenging (Oruganti, 2011)
- The harmonization of organic standards and certification is important to facilitate international trade in organic products
- Sourcing organic inputs, including feeds, forages and supplements
- Replacement of heifers
- High cost of production and maintaining animal health
- The safety of organic versus conventional foods also remains unresolved
- Constraint with respect to land as landless farmers are not eligible to set up organic dairy farm (Subrahmanyeswari and Chander, 2008)
- Biological and integrated pest management is a challenge in organic food production
- Despite the widespread conviction of the public that organic food is 'healthier' than foods produced using conventional farming, evidence to support this perception is difficult to identify as there is very limited research conducted and much of the available scientific data is out-dated or based on inadequate study designs.

By considering these challenges, Pathak *et al* (2003) suggested that policy initiatives on organic farming must focus on the following issues which may turn the constraints into a big opportunity:

- Improvisation of organic standards
- Development of regional standards
- Establishment of low cost certification agency

- Development of a strong domestic market
- Establishment of a 'Growth Centre' for organic production
- Research and development
- Training and extension
- Legislations at government levels

Conclusion

Since the beginning of the 21st century, the development of organic farming worldwide has shown a strong growth. Organic production differs from conventional production principally due to its emphasis on preserving the fertility of soil, evading pollution, producing food with optimal nutritional quality, reducing the use of non-renewable resources, etc. The organic dairy sector continues to be a fast growing segment as organic milk gives a feeling of safety and environmental protection to consumers, and the global demand for organic products is creating a new export opportunity for developing countries. However, mastitis, one of the diseases routinely treated with antibiotics, as well as helminthiosis, may pose an important problem in health management of organic dairy herds as the prophylactic use of anthelmintics is not allowed in organic dairy production. Thus, mastitis and parasitism seem to be the challenging diseases under organic dairying. At times organic foods may have a high microbial load due to prohibition of irradiation, disinfectants etc. At the same time, organic dairying ameliorates concerns on animal welfare, chemical residues, incidence of BSE (Bovine Spongiform Encephalopathy), Foot and Mouth Disease, Genetically Modified Food (GMF) and some bacterial diseases. Hence efforts are needed to educate and train farmers regarding stringent guidelines for organic milk production through effective extension education. Conclusively, it can be said that organic dairying encourages self-reliance in the production of high quality milk and milk products, financial security to farmers and rural dwellers and food security for all.

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Inviting Articles on Outstanding Success Stories/Case Studies

Indian Dairyman is a magazine that prides itself on the dissemination and sharing of knowledge and information related to the dairy world. Often this has proved a source of inspiration to many. We call upon our readers to contribute whole-heartedly to this magazine and welcome accounts of outstanding success stories in the world of dairying. Case studies from various parts of the country are also welcome. Such stories serve to educate and inform the entire dairy community and will be much appreciated.

Further, well researched articles and features which are of interest to the layman and the general reader by providing him/her knowledge related to dairying are also welcome.

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