Challenges and opportunities in promoting good dairy farming practices

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Abstract This paper reviews ongoing dairying practices among different stakeholders and suggests plausible solutions for enhancing the adoption of Good Dairy Farming Practices (GDFP). GDFP conceptualized by Food and Agriculture Organization and the International Dairy Federation delineates six key elements viz Animal health, Milking hygiene, Nutrition (feed and water), Animal welfare, Environment and Socio-economic management. Health consciousness, disease burden, productivity, extension and policy support are the major influencing factors for GDFP adoption. India being the place of small scale producers has both limitations and opportunities to produce milk as per growing consumer demand. Number of private players, corporate houses, NGOs and research organizations experimented and evolved good practices and approaches which can be easily emulated by other interested stakeholders for production of high quality healthy milk and milk products. Rechristening the role of various organizations along with policies and programmes would pave the way for sustainable dairy production, processing and marketing through adoption of GDFP.

Keywords : GDFP, livestock, organic farming, animal welfare, environment

Introduction

Concept of GDFP

GDFP as a concept was introduced in 2004 (FAO and IDF, 2004) by International Dairy Federation/Food and Agriculture Organization (IDF/FAO) and it was later updated in 2011 (FAO and IDF, 2011). Good Agricultural Practice (FAO, 2008) for dairy farmers is about implementing sound practices on dairy farms - collectively called Good Dairy Farming Practice. These practices emphasize the production of safe milk and milk products which is suitable for their intended use and make the dairy farm enterprise as viable farm enterprise, from the economic, social and environmental perspectives. It is equally important to motivate the farmers to produce safe and quality milk for better market returns.

The international framework to ensure the safety and suitability of milk and milk products is contained in the Codex Recommended International Code of Practice - General Principles of Food Hygiene (CAC/RCP 1- 1969, Rev. 4, 2003) together with the Codex Code of Hygienic Practice for Milk and Milk Products (CAC/RCP 57-2004). GDFP recognizes that all participants in the chain viz., dairy farmers, suppliers to dairy farmers, milk carriers and haulers, dairy product and food manufacturers, distributors, retailers and consumers should be part of an integrated food safety and quality assurance management system. GDFP encourages dairy farmers to adopt 'proactive' preventative practices at the farm level rather than waiting for problems to occur.

GDFP covers best part of every practice i.e. Clean, Scientific, Organic, Innovative, Improved and Natural (GRAIN, 2014) dairy farming practices under its domain as it may often be difficult to get proper market and price when going totally for organic way of production (Ponnusamy and Lal, 2014). The ecological approach often requires a lot of skill, labour and often a yield penalty (Conway, 2014). GDFP needs to be promoted through collective approach to produce more milk at affordable prices.
Need for promoting GDFPs

FAO projections suggest that global milk production and consumption will rise from 568 to 700 million tonnes over the period from 2000 to 2020 (FAO, 2002). This increasing demand is mainly due to burgeoning population, changing food habits and urbanization. For example, the middle class population will be one billion and 475 million in China and India respectively by 2030 (Ernst & Young, 2011). As people with higher socio-economic status prefer healthier diets (Wang et al., 2014), harnessing the potential of burgeoning middle class and their preference for healthier diets through GDFP would be the right strategy in future. India's milk production had gone up from 17mt in 1951 to 132.43mt in 2012-2013 (DADF, 2014) primarily due to proactive role played by dairy cooperatives under the Operation Flood program. So, if India becomes the leader in GDFP promotion and practice, it would add more employment in India and supply high quality milk and milk products.

After independence, due emphasis was given by government of India for increasing the quantity of milk production through package of practices. But, along with healthy practices, unhealthy practices also gained among farmers and other concerned stakeholders such as vendors, processors and shop keepers in several places across the country. The necessity for promoting GDFP rose because 'organic dairy farming' in many circumstances was not feasible and practicable (Borell and Sørensen, 2004). One of the recent findings by USDA revealed that economic forces have made organic operations more like conventional operations and that the future structure of the industry may depend on the interpretation and implementation of new organic pasture rules (McBride and Greene, 2009). When an organic animal is treated with antibiotics for an illness, she may never be milked in an organic herd again. She may be removed from the organic dairy herd ever (Grossi, 2010; Karreman, 2014). 'Organic dairy farming' face many problems in animal health and welfare that remain unresolved and present a challenge for individual producers and the industry as a whole which include: achieving balanced, 100%-organic, feed rations that produce adequate growth rates and high product quality, animal friendly transport and slaughtering, sustainable use of local resources and, last but not the least, profitability and efficient use of resources (Rahmann and Godinho, 2012). So, it will be relevant to know how 'organic dairy farming' differs from GDFP and in what manner GDFP gives more practicable and attainable solutions.

Dairy farmers, as the primary producers in the supply chain, should also be given the opportunity to add value to their product by adopting methods of production that satisfy the demands of processors and customers. For example if the consumers demand sweetened condensed milk (SCM) then GDFP provides an opportunity to the farmers and processors to prioritise their production and marketing strategies. GDFP use an identification system that allows all animals to be identified individually from birth to death and it is done by detecting animal diseases early, prevent spread of disease among animals, ensure food safety and ensure traceability. In GDFP, animal welfare has been covered under 'five freedoms': 1) Freedom from thirst, hunger and malnutrition 2) Freedom from discomfort 3) Freedom from pain, injury and disease 4) Freedom from fear 5) Freedom to engage in relatively normal patterns of animal behavior.

Agencies promoting GDFPs

There are only few agencies in India which is practising GDFP in totality. But, there are various organizations which are promoting organic dairy farming which can be properly harnessed to promote GDFP to those farmers who cannot fully adopt the same as per the standard specified by regulatory organisations.

Moreover several other small and big agencies are promoting GDFP by following its few recommendations such as: Navdanya foundation, Patanjali Kudrati Kheti, Agriculture & Organic Farming Group India, All India Organic Farmers Society, ICAR through- AICRP Integrated Farming System Research, Modipuram including Network Organic Farming project.

Factors influencing GDFP adoption

Several factors tend to influence the adoption of GDFP which vary depending upon the region, nature of farmer and prevailing policy support for the dairy enterprise. The price received by the produces, health consciousness of consumers, economic loss to farmer due to disease burden, extent of extension support and future scope of dairying will also be the defining factors of GDFP adoption.

Health factor: The consumers are increasingly becoming conscious of what they eat and drink. Health and food quality are major drivers for the market and food safety is a key consumer concern (FSSAI b, 2011). Consumer in India wants access to safe, tasty and healthy milk and its product at affordable prices where GDFP could play a significant role in producing hygienic milk with better care. In 2011, India was on high alert against deadly E. coli strain that causes kidney
failure (FSSAI a, 2011). These types of deadly strains can easily be minimised through adopting hygiene practices as defined under GDFP.

Economic factor: India losses Rs.7165.51 crores on account of mastitis (Bansal and Gupta, 2009) and it stands second to FMD as a most challenging disease to high yielding dairy animals in India (Varshney and Mukherjee, 2002).

Productivity factor: Till 2030 the demand of dairy products is expected to grow at a rate of 9-12 per cent and industry at a rate of 4-5 per cent. Clearly Indian industry will struggle to maintain 100 per cent self-sufficiency due to huge local demand of 170 Million Tonnes of milk by 2030 (Dairy Industry Vision 2030, 2014). In India current average milk yield is 4.2kg/animal/day. Average indigenous, buffalo and crossbred yield is 2.36 kg/animal/day, 4.80 kg/animal/day and 7.02 kg/animal/day respectively (DADF, 2014), which can be increased by focusing on the key area of GDFP i.e. animal health, animal nutrition, animal welfare and socio-economic management.

Challenges ahead in promoting GDFP

The major challenges in promoting GDFP are lack of awareness among farmers and other stakeholders, bio-physical constraints, rampant adulteration in milk and milk products, synthetic milk, poor infrastructure, false propaganda, harmonizing global standards (AMUL, 2013), needed government programmes and affordable prices for the milk and milk products. These are discussed in the following paragraphs:

In a nationwide survey on milk adulteration by Food Safety and Standards Authority of India (FSSAI), a total of 1,791 samples were drawn from 33 states and out of which 68.4%

<table>
<thead>
<tr>
<th>Table 1 Good Dairy Farming Practices versus Organic Dairy Farming</th>
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<tbody>
<tr>
<td>Enabling farmers to add value to their product</td>
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<tr>
<td>Profitability is combined with the responsibility</td>
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<td>Individual practices will vary in their applicability to</td>
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<tr>
<td>various dairying production systems</td>
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<td>Farmers can choose and implement those guidelines that</td>
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<tr>
<td>are of relevance to their situation</td>
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<tr>
<td>Health of the animal is prime concern</td>
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<td>Use all chemicals and veterinary medicines as directed.</td>
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<td>Withholding periods of medicines is taken care</td>
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<td>Use an identification system that allows all animals to be</td>
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<td>identified individually from birth to death</td>
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<td>Manage animal diseases that can affect public health (zoonoses)</td>
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<td>Ensure milk is cooled or delivered for processing within the</td>
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<td>specified time</td>
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<td>Only approved chemicals are used appropriately on pastures</td>
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<td>and forage crops and observe withholding periods</td>
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<tr>
<td>Provide housed animals with adequate ventilation</td>
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<td>Maintain and/or encourage biodiversity on the farm</td>
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<td>Protect dairy staff from exploitation</td>
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<td>More time taking to practise</td>
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<td>Such conflict has been resolved by integrating the 6 main</td>
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<td>objective of GDFP</td>
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<td>'Five freedoms' has been described under animal welfare.</td>
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Source: (Lal et al., 2014)
of the samples did not confirm to the prescribed standards that were tested in the government laboratories as per the statement of Union Minister for Health and Family Welfare (Gurusamy, 2015). Further the report suggests that in urban areas, 68.9 per cent of milk samples had been adulterated, compared to 31.1 per cent of samples in rural areas. In national capital, 70 per cent of milk samples failed in the Laboratory test (Sinha, 2012). In addition, false propaganda about the use of oxytocin in dairy animals should be checked (Prakash, 2009; Beniwal, 2015). Hence, the agencies which work for maintaining milk quality such as Food and Drug Administration (FDA), Food Safety Standards Authority of India (FSSAI) and Department of Consumer Affairs under Ministry of Consumer Affairs, which need to be further supported for better delivery of monitoring and other services.

Synthetic milk: There is not much difference between 'real' milk and its synthetic variant, except that the former one nourishes and the other one kills. They taste and look so similar that human senses fail to detect. Even titanium oxide is used to produce synthetic milk. The synthetic milk is sold for Rs. 3-8 per litre and is supplied for biscuits, milk powders and even for road side tea stalls (Agha, 2014). Addition of synthetic milk is on large scale in Meerut district of U.P. and mostly urea in such milk creating huge problem of headache, eyesight and diarrhea in children (Bhatt et al., 2009). So, this issue of synthetic milk is a critical one and it should be publicized more. If the gravity of this issue is not highlighted, more people would get susceptible to the dodgy products. Vehicles should be provided to the team of (Food and Drug Administration) FDA's officers to conduct raids even at village dairy cooperatives. Amul has launched mobile van to conduct checks of milk samples, but these type of efforts are only few.

Stringent implementation of laws and regulations: Although the laws specifying the standards for milk products are covered under the Food Safety and Standards Act (FSS Act), the actual implementation at field level is faced with several constraints including lack of adequate personnel, infrastructure and budget provisions. This needs to be addressed in a systematic manner including awareness creation about punishment for unlawful activities. For example, the punishment for selling adulterated food is seven years imprisonment with a fine of Rs 10 lakhs. One could face a maximum fine of Rs 10 lakh for selling sub-standard food and, the offender could face seven years jail term to life imprisonment for death caused by adulterated food (FSS ACT, 2006). Food Safety and Standards Authority of India has released manual for analysis of Milk and milk products, which deals with detection of adulterants in plethora of dairy products such as: Liquid milk, Curd, Chhanna, Paneer etc. thus promoting food safety and human health (FSSAI, 2012). To celebrate World Milk Day on June 1, the Ministry of Food and Drug Administration (FAO, 2012) embarked on a month-long campaign to make consumers aware of various ways to identify milk adulteration.

Seizing opportunities through promotion of GDFP

Opportunities to produce safe and healthy milk with better employability: The dairy sector has grown rapidly in India where smallholders with two to five dairy animals remain dominant, supplying about 80 per cent of the regional milk

Table 2. Role of different agencies in promoting GDFP

<table>
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<th>Name of the agency</th>
<th>Role in promoting GDFP</th>
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<tr>
<td>Parag Milk Foods Pvt Ltd through Bhagyalaxmi Dairy Farm, Manchar, Pune</td>
<td>A brand name with 'pride of cows' was launched in 2011 with unique concept i.e. F2H (Farm to Home) serving high profile clients in Mumbai (Dairy show, 2013). USP of 'pride of cows' is to produce pure milk without human touch directly from Cow to Customer at a temperature of 4 degrees (Ponnusamy and Lal, 2014). The success behind Bhagyalaxmi Dairy Farm is that they love their cows and treat them well as the family members. An unique practice GDFP opted by Bhagyalaxmi Dairy Farm is that music is provided in the sheds and vehicles can only enter dairy premises after cleaning the wheels with water.</td>
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<td>Korgao Collective Farming Cooperative Society</td>
<td>A vermiculture unit has been set up by Korgao Collective Farming Cooperative Society under a corporate social responsibility project of Goa Shipyard Ltd. implemented by Tata Institute of Social Sciences (TISS) at Korgao village in Pernem taluk of north Goa. It is being seen that many dairy firms are washing away their dairy waste with fresh water but the society vermiculture units convert dairy waste into high value vermicompost, thus promoting GDFP. Society also includes creating facility for green fodder production using hydroponics, a GDFP for resource rich dairy farmers (Ponnusamy and Lal, 2014).</td>
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The milk production rose to 134 million tonnes from about 31.6 million tonnes in 1980-81 (DADF, 2013), providing supplementary income to some 90 million farmers, of which 75 million are women in over 500000 remote villages (FAO, 2011; GRAIN, 2014). This achievement is largely credited to the contribution of dairy cooperatives, under the Operation Flood Project, assisted by many multilateral agencies, including the European Union, the World Bank, FAO and WFP. Moreover, animal products, such as eggs and milk, can be produced, processed and sold throughout the year without seasonal restrictions, which facilitates the smooth household cash flow, including meeting unforeseen expenses. GDFP can provide access to safe and healthy milk at affordable prices to the world and in that India can play a vital role.

Opportunity to earn foreign exchange by export of dairy products: India's exports of Animal Products was Rs. 32288.57 crores in 2013-14 and within that the second largest share was of Dairy Products (APEDA, 2014) and if GDFP is followed, there are bright prospects for earning considerable foreign exchange through export of milk and milk products with certification.

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Conclusions

In India, although, there are guidelines for clean milk production, farmers try to adopt most of the practices at production sites, but issues become serious when middlemen including milk vendors try to do unhygienic and illegal practices before reaching ultimate consumers. The challenges such as poor awareness about hygienic milk production practices, lack of budgetary support, ineffective implementation of laws regulating the safe supply of milk and milk products and prevalence of adulteration and synthetic milk need to be tackled through appropriate strategies. In the midst of numerous challenges and limitations to production and marketing of safe and hygienic milk, several role models exhibiting adoption of GDFP from production to marketing have come up in India which needs to be up scaled to larger dairy production environment. This requires strong policy support, sensitization of all stakeholders, complimentary extension delivery system, credit support to practice GDFP and convergence of efforts of various agencies.
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