



The wallowing pool helps the cows to cool down, especially during the hot summers

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A case study of high welfare milk production in India

Milk production in India

India is the world's largest single milk producer, with a total of 132.4 million tonnes of liquid milk produced in 2012-2013.¹ Livestock production is the most important agricultural activity in the country, contributing about 24.8% to the agricultural gross domestic product. The value of India's milk output during 2012-2013 has been estimated at over Rs.2,900 billion (approximately US\$ 45 billion), higher than the combined value of other major agricultural crops like paddy, wheat and sugarcane.²

Dairy farming dominates livestock production, providing 18 million people, 70 per cent of them women, with employment. The dairy sector is also the major source of income for an estimated 27.6 million people.³ The majority of milk production is still carried out by

The future of the Indian dairy industry depends on better efficiency to meet growing demand. However, it is also important that animal welfare is respected. This case study shows how a commercial dairy farm in the state of Haryana is achieving high milk yields and at the same time providing its cows with a comfortable environment.

small-scale, often landless farmers, who get a large share of the total price paid by consumers (77 per cent). In comparison, producers in Germany only receive 48 per cent and in the United States only 45 per cent of the total price.⁴ This makes milk production very attractive; it offers many of India's farmers a way out of poverty.

However, compared with other major world dairy producers the average milk yield is poor, reflecting that technological input is low. While in India the average yield per dairy cow per year is estimated to be 1,284kg of liquid milk, the figure is 6,212kg in the European Union and 9,117 kg in the United States.⁵ Consumption per capita is still low compared to other regions but is increasing, fuelled by the growing population and urbanisation.



Fresh feed is available all year around and is prepared on-farm

Consumption per capita is still low compared to other regions but is increasing, fuelled by the growing population and urbanisation. In the past, increases in milk yield were achieved through a concerted national strategy, Operation Flood, nevertheless, it is estimated that demand will soon outstrip growth.⁶

Increases in productivity in low-yielding systems can bring benefits through a boost in the milk supply and a higher rural income; they can also mitigate climate change by diluting greenhouse gas emissions.⁷ However, genetic selection for higher milk yields has in the past led to an increase in diseases such as mastitis and lameness, two of the most serious animal welfare problems affecting dairy cows.⁸ It is therefore vital to encourage new approaches to dairy farming that improve milk production but do not repeat past mistakes. This case study presents one possible approach to the current challenges faced by the Indian dairy industry.

An overview of the Kisan Dairy farm

Kisan Dairy is owned by the Kumar family and is located in Tarawadi, an agricultural hub in the state of Haryana. The dairy started in 1987 with 20 cows - 10 indigenous and 10 Holstein Friesian crosses. It has been growing ever since and in 2014 had 90 dairy cows and a total of 222 cattle, the vast majority of which are cross bred for better suitability to the hot and humid local conditions.

The Kumar family owns 50 acres (approximately 20 hectares) of land, where most of its cattle feed is grown. The local climate allows the growth of several crops a year and ensures a stable supply of fresh feed all year around. Along with green fodder, the farm grows maize, sorghum, barsim grass and oats in rotation. Surplus feed is converted into silage and stored as backup against shortages in the rainy season and during lean periods when fodder is less available.

This diet is supplemented with high energy and protein concentrates sourced locally and mixed at the farm. The concentrate is based around cotton seeds, soy, rice bran, mustard, barley and maize. Rice is grown locally, and during the harvesting season, rice bran is purchased at a very low cost from neighbouring farms and used as part of the concentrate. Paddy straw, another by-product from local agriculture, is used as bedding material for the cows at calving and is incorporated back into the land as fertiliser. Troughs provide



Loose housing system at Kisan Dairy

fresh water round the clock, although water quality is not formally monitored.

Kisan Dairy employs four family members and 12 other people recruited locally who are responsible for milk production as well as the marketing of the milk in the local village. The marketing model is similar to many other dairy farms in India: the milk is sold directly to consumers twice a day at the farm gate and at sales points in the village. As of May 2014, the price of milk is Rs.34 per litre.

In winter, when production reaches its peak, surpluses are sold to the local dairy cooperative. This short distribution chain ensures maximum income for the producer and guarantees the freshness of the milk. In the hot conditions of Haryana, the milk must be distributed rapidly and efficiently to the consumer to avoid spoilage and maintain value as there is a lack of widespread refrigeration. The milk produced is also consumed by the family members and workers.

Kisan Dairy produces 1,100-1,200 litres of milk per day during the wet summer months and 1,800-2,000 litres per day during the dry winter months. This level of productivity is nearly six times the national Indian average. Longevity is also an important aspect of the success of the operation: cows at Kisan Dairy tend to have between seven and eight lactations on average. Healthy, long-lived cows save on replacement costs and expensive veterinary treatments and guarantee a stable milk supply. The owners attribute this long and productive life to good quality feeding, genetics appropriate to the local environment and the high level of care, which all lead to good health and welfare.

Housing and feeding the cows

The cows are separated into groups - lactating, pregnant, dry and young stock - with lactating cows being further separated into high yielding (producing above 25 litres daily) and low yielding (producing up to 25 litres daily). The feed and care requirements at each stage of lactation vary and this separation makes it easier to meet those different needs.

Cows are loosely housed in outdoors pens. Only small sections of the flooring are paved, while the remaining area is covered with straw, pumice and ash for bedding. The soft and comfortable lying areas and floor ensure that good leg and hoof health is maintained.

“These cows are able to pay for their feed, my bank loan instalments, feed for non-milking cows, the maintenance of calves, the salary of workers and the running of my household; I can’t ask for anything else. I am in dairy farming because I love cows and they are not putting any additional financial burden on me.”

Randeep Kumar, co-owner, who is very happy with the financial returns from the farm.

Manure is manually removed twice a day, which ensures that cows are living on dry flooring, further contributing to good hoof health.

Trees as well as shelters built specifically for thermal comfort provide shaded areas. During heavy rains, pregnant and milking cows are moved to a separate covered area. In the last few years, an innovative wallowing pool was built, to help cows regulate their body temperature. Cows can choose to use the pool, and do so especially during the hot summers. While it has been suggested that an increase in mastitis could be a possibly negative effect of using these pools, Naresh Kumar, owner of the farm has not seen any increases since it was put into use. The pool is cleaned every 10 days.

Milking the dairy herd

Milking is carried out using portable milking machines twice a day. The workers clean the cows’ teats before attaching the machines to the udders and afterwards apply an approved anti-bacterial solution. It takes two hours to complete one milking cycle with five milking machines.

Naresh and Randeep think that this area of the operation could be improved and they are considering investing in a new mechanised milking parlour to increase efficiency, improve hygiene and reduce

milking times. The family is carefully studying the return on this investment ahead of making any decision.

Retention of a competent and dedicated workforce is an important aspect of the operation, enabling it to run smoothly. The majority of the workers have been employed at the farm for nearly 14 years.

Solving the dairy calf issue

After birth, both male and female dairy calves at Kisan Dairy are allowed to suckle from the mother for three days; they are then separated from them and bucket fed. Female calves are either reared as replacement stock or sold to neighbouring farms. The dairy sells high genetic merit male calves (those born to high-yielding cows) to neighbouring farms and the Kumar family is fortunate enough to run a gaushala close to the village which takes some of the calves as well as non-productive cows. However, Naresh Kumar recognises that these are only temporary solutions. He has now started to invest in expensive sexed semen. While a straw of regular semen cost Rs.10 from government semen stations, a straw of sexed semen costs Rs.1,000. While this is more expensive, using sexed semen is beneficial because most of the offspring will be female and can be used for replacement in the herd or sale.

Management and veterinary practice

The farm employs a veterinarian who visits the farm most evenings. In his absence, Naresh Kumar carries out inspections, vaccinations, de-worming and artificial insemination. Naresh went on a training course conducted by the National Dairy Research Institute (NDRI) in Karnal, where he learned the basics of animal care, artificial insemination and pregnancy diagnosis. He keeps in regular contact with this important dairy science institute to keep his knowledge up to date.

Recycling manure back into the land

Managing cattle manure in large-scale dairy farms such as this one is challenging. Some of the manure produced at Kisan Dairy is applied back to the farm’s fields. This reduces the need for artificial fertilisers and promotes soil fertility. The excess is sold to neighbouring farms generating additional income of around Rs. 500-600 per 10 tonnes.

The fate of dairy calves

A particularly challenging issue in dairy production in India is what to do with male dairy calves. Many states have banned the slaughter of dairy cattle, and beef is not a popular meat due to cultural and religious factors. As a result, male dairy calves have a very low value. They are often not allowed colostrum from their mother after birth, which is essential to building immunity against infections and would provide them with a good start in life. Some of these animals are destined for ‘gaushalas’ (or retirement homes for cattle), but the size of the national dairy herd in India means it is not easy to provide every single animal with adequate care. Sexed semen is a recent innovation that can help to avoid this challenge but its high cost does not make it a feasible option for many farmers in India.



Milk yield at Kisan Dairy farm is several times higher than the national Indian average

Conclusions

- ❖ Good quality feeding, genetics appropriate to the local conditions and favourable levels of animal care are leading to good health and welfare. This in turn delivers levels of productivity nearly six times higher than the current national average.
- ❖ Healthy, long-lived cows save on the cost of replacement and expensive veterinary treatments and guarantee a stable milk supply.
- ❖ Training and regular updating of dairy management knowledge is crucial in maintaining the dairy cattle's health, welfare and longevity, and ultimately the success of the dairy enterprise.
- ❖ Manure is recycled and used on the land reducing the need for artificial fertilisers and excess manure is used as a source of additional revenue.
- ❖ The farm uses several by-products from agriculture, ensuring a good use of local resources. This also contributes positively to food security by transforming biomass that is otherwise unusable by humans into milk.
- ❖ The final destination and the welfare of male dairy calves is a challenging issue that needs to be addressed by the entire dairy industry in collaboration with all interested stakeholders.

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A model for dairy farmers in India

Dr ML Kamboj, Senior Scientist at the NDRI said of the farm:

"The breeding, feeding, housing and healthcare practices followed at Kisan Dairy are as per current scientific recommendations. The farmer is well-trained and experienced in cow management. The cows are able to realise most of their natural behaviours due to proper housing, climatic protection and good feeding and therefore farm productivity is better with minimal health problems. There is a proper mechanism for dealing with old and other unwanted animals.

"There are a few areas where there is scope for further improvement, specifically with respect to proper calf housing facilities and mechanised sanitary milking practices, which need financial investment, but the farmer plans to add these in the near future. Still, as the cows appear comfortable, well-fed and satisfied and are performing well without major health or behavioural problems, this farm could be rated as very good from a cattle welfare perspective. The farm may therefore be considered a model, which could be replicated under most Indian farming conditions to promote sustainable commercial dairy farming."

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