

FUELLING A NATION: A LOOK AT THE EARTH'S BIGGEST DAIRY PRODUCER

HOME to more than 1.2 billion people and 50 million cattle at the last count, India is both the largest producer and consumer of dairy products in the world.

Due to a booming population and an active approach to developing and expanding its dairy industry, it is estimated dairy sales will more than double in the next five years.

This is in stark contrast to the situation of the UK dairy industry and is surprising to hear given that much of India remains in an underdeveloped state and poverty is an ongoing concern, particularly in rural areas. The majority of the expansion and development continues to occur in the larger cities, mostly driven by the telecommunications industry. However, away from the bustling cities, it is clear cattle still play an important role, with up to 75 per cent of households owning two to four cows and income from the dairy industry supporting one in three rural families.

While we often look to learn from countries such as New Zealand, America and Canada, I was intrigued to find out more about the world's largest producer. With the rare opportunity to spend several weeks abroad, I travelled to south-east India, working with both government and private vets in and around the city of Madurai in the Tamil Nadu region.

The status of the cow

Hinduism remains the most prominent religion in India and Hindus regard the cow as sacred.

SARA PEDERSON

BSc(Hons), BVetMed, CertCHP, MRCVS

provides an overview of milk and egg production in India, discussing the huge growth expected in the industry and the problems it faces daily

Cows are allowed to roam freely, making them a common sight among the bustling city streets – Delhi alone is home to 40,000 cows. The belief that the cow is sacred originates in ancient times when she was considered as a mother goddess due to the importance of her milk in sustaining life. She is seen as a symbol of the earth, a provider of nourishment and ever giving, yet undemanding. Even in modern times, the cow continues to be revered – killing or injuring a cow still results in imprisonment in some parts of the country.

Buffaloes too

The Indian dairy industry is unique in that, alongside cattle, buffalo still play a considerable role, accounting for nearly half of the bovine population and 55 per cent of total milk production. Buffalo milk is traditionally preferred due to its higher fat content, and thus higher value, but dairy cattle are increasing in popularity as improved genetics is leading to increased yields.

Most of India is predominantly vegetarian and milk is an important part of most daily Indian dishes. Nearly half of the milk produced is consumed in liquid form, with the remainder processed into various milk products. Ghee is produced using approximately a third of the milk and is a form of clarified butter. It is not only a common ingredient or accompaniment in many southern Indian dishes, but also

plays a role in Hindu ceremonies.

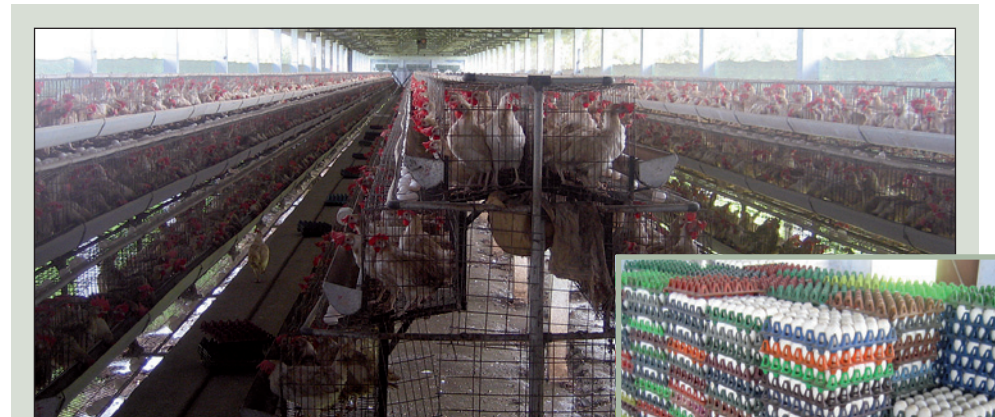
It is estimated that only around 35 per cent of the milk produced in India is marketed through formal channels (such as dairy cooperatives) and the remaining 65 per cent is sold informally, particularly in rural areas. Farmers remain in control of how and where they sell their milk and their decision is largely based on the price they will get, but also how much help they will receive if they wish to expand the herd. Many of the dairies provide farmers with loans to purchase cattle – which are then repaid through the supply of milk – and give them access to modern extension services that allow them to improve management, feeding, fertility and veterinary care.

The local cooperative supplying Madurai is SNP Dairy Milk. Raw milk is collected from local farmers, averaging three to five cows, and delivered to the main processing plant in Madurai where it is pasteurised and packaged. The price the farmer receives is based on fat percentage (4.5 per cent; solids-non-fat 8.5 per cent), with no testing for cell count or antibiotic residues. The average price a farmer receives is 13 rupees/litre (18p), with the cost of production being eight to nine rupees/litre (12p). The majority of farmers have two to three cows producing between 10 litres and 15 litres per day, providing an average daily income of approximately 400 rupees (£5.50).

The sacred dairy farm

To appreciate the day-to-day running of an Indian dairy farm, I spent time working on a sacred farm in the middle of Madurai (population 2.1 million). This was the largest dairy farm in the Tamil Nadu region, comprising 75 milking Jersey and Friesian cows plus youngstock. The farm

achieves the highest yields in the region, with cows averaging 10 litres per day, and is run as a sacred non-profit farm supplying raw milk to the 6,000 residents of the tower-



Above: the chicken farm at Vaddipatti contains 15,000 chickens. Inset: eggs ready for delivery into Madurai city.

ing apartment blocks that surround it. Due to the increasing demand for extra housing in the city and an inability to find reliable labour, the farm decreased in size from 300 cows several years ago and the excess land was used to build the apartment blocks it now supplies.

Cows are tethered in lines of six on natural soft stone and protected from the glaring sun and monsoon rains by canopies of straw. The climate means temperatures rarely drop below 20°C and it remains hot and humid throughout the year – therefore overhead fans are used to provide some relief against the constant humidity. The level of care and attention that each cow receives is astounding, with one member of staff responsible for just six cows. Each cow is hand-fed three times per day and washed four times per day, which not only helps cool the cows, but also keeps them clean.

Milking is carried out three times per day by a separate team of staff, using a combination of hand and machine milking. One man is responsible for a row of 12 cows and has access to one cluster unit, taking around two hours to milk each row. Care and attention is paid to the milking process, despite the basic facilities, and staff are educated about the importance of the milking routine in relation to clinical mastitis. Calves are allowed access to their dam prior to milking to aid with milk let down and the udder is washed in a potassium solution before and after the cow is milked. The milker is also encouraged to wash his or her hands in saltwater between individual cows and the machine liners are rinsed through with boiling water when milking is complete. Each cow's milk is collected and then weighed and recorded in the centrally located dairy before being sold to the local residents who begin to queue as soon as milking starts. One litre of raw milk is sold for 24 rupees (approximately 33p).

Following morning milking, a local Hindu priest visits and all

members of staff are involved in a ceremony in which the cows are blessed and thanked. A private vet treats sick cows and carries out any required artificial inseminations. Due to the humidity and abundance of flies, mastitis is a common problem and it is not unusual for cows to suffer from three to four clinical cases per year. Each cow is identifiable by its eartag number. Every animal has its own record card on which all veterinary treatments and management events are recorded in detail. For example, "calved 19/11/2010 9am heifer calf, alive, forwards, no assistance".

Cows are fed three times a day with a ground maize-based concentrate that is mixed with water before feeding. All crops are grown and processed on the farm and cows have access to forage throughout the day, including freshly chopped grass, sorghum, straw and a spinach-type forage that is local to the region. Feed is placed in stone troughs and these are meticulously cleaned every day, with any leftover forage removed and composted.

The respect Indians have for their cows was very clear and there was a great sense of pride among the workers, with each keen to ensure that his or her cows were the cleanest and best cared for. This was also evident when, at the end of my time at the farm, each wanted one of their cows to be in the group photograph.

The chicken farm

There was just one chicken farm supplying eggs to the whole of Madurai and surrounding communities. Located in Vaddipatti to the north of the city, the farm is home to 15,000 laying hens and 10,000 chicks, all housed under one roof. There is no legislation in India regarding poultry welfare and the majority of chickens spend their lives in battery cages. The Dalai Lama has called for India to follow in the footsteps of many other countries and ban the use of battery cages.

The birds are kept four to a



SARA PEDERSON graduated from the RVC in 2005 and has worked in farm practice since, gaining her certificate in cattle health and production in 2009. She is an assistant at Nantwich Farm Vets in Cheshire where she combines her interest in research with routine clinical work. She is studying for a diploma in bovine reproduction.

cage and the cages were stacked in long rows in such a way that all manure was able to fall to the ground below where it was periodically collected and sold to local farmers as fertiliser. The farm had recently been modernised so all feed and water was automatically supplied to keep labour costs down. The eggs were collected via a conveyor belt system before being hand-packed into trays and delivered into the city.

Although the automatic nipple drinkers were convenient, they also posed a problem, as they were the main source of disease, with contaminated water a constant concern due to the scarce supply of clean water. The main disease problems were diarrhoea due to bacterial causes, such as *Escherichia coli*, with coccidiosis and *Eimeria* species rarely involved. As a precaution, the water was regularly tested for *E coli* and narfloxacin was used as an in-feed antibiotic. Birds were not vaccinated against *Salmonella*, although I was assured this posed little threat to public health. Unfortunately, a week later I found this was not entirely the case when following sampling a special type of Indian "eggy bread", I got an experience I hadn't bargained for. ■

Left: this cow was suffering from pneumonia, a common problem during the wet season. Below left: an Indian milking "machine". Below inset: milk is collected during milking before being sieved and weighed at the dairy. It is then sold directly to the occupants of the local tower block.

