Topic Page: Water buffalo

Image from: **The Asiatic water buffalo (Bubalus bubalis) feeds...** in *Philip's Encyclopedia*

Summary Article: **Water buffalo**
From *The Encyclopedia of Farm Animal Nutrition*

There are 169 million water buffaloes *(Bubalus bubalis)* in the world, compared with a cattle population of 1350 million. There are two main types. The swamp buffalo has large curved horns and is used primarily as a working animal; it is found in the Philippines (where it is often called the carabao), in India and in other countries of South-East Asia. The river buffalo is found in India, Egypt, Europe, the Caribbean and South America; it has lightly coiled or drooping straight horns. River buffaloes supply both draught power and milk; 35% of India's milk animals, other than goats, are river buffaloes and they produce almost 70% of India's milk.

Buffaloes have been used in India for 5000 years and in China for 4000 years but for only 1000 years in Europe. Most buffaloes are located in Asia but there are 3 million in Egypt, > 1.5 million in Brazil (imported during the last 80 years) and small numbers in Trinidad and other countries of the Caribbean and South America. Buffaloes have a quiet temperament, unlike the wild African buffalo *Syncerus caffer,* which has a reputation for being very dangerous and unreliable.

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Water buffaloes can live in temperate climates but can overheat in hot climates, especially when used for work, because they have a limited ability to lose heat by sweating compared with cattle. Buffaloes produce good lean meat and provide rich milk. The butterfat from buffalo milk is the major source of cooking oil (ghee) in India. Buffalo milk contains twice as much butterfat as that produced by dairy cows. Mozzarella cheese is made from buffalo milk. In Hindu countries such as India and Nepal, where cows cannot be killed, the slaughter of buffaloes is permitted and their meat can be eaten.

There are no distinct breeds of swamp buffalo but they do vary in size from area to area. For example, swamp buffaloes in Thailand average 450-500 kg, whereas in Burma they average 300 kg. There are 18 breeds of river buffalo in India and Pakistan, classified by area of origin: Murrah, Gujarat, Uttar Pradesh, Central India and South India breeds. The swamp buffalo is reported to have 48 chromosomes and the river buffalo 50 but this may not be true, because they contain similar chromosomal material and produce fertile offspring when crossbred. Cattle have 60 chromosomes and will mate with buffalo but offspring are infertile.

When adequately fed, both males and females reach puberty at 18 months of age. Oestrus lasts for 24 h (range 11-72 h) with a 21-day cycle. Buffalo show few outward signs of heat and often mate at night. Conception may be as high as 80%. The semen can be frozen. The gestation period (310 days) is longer than that of cattle *(c.* 280 days). The first calf is normally born before the dam is 3 years of age. Buffaloes will return to heat 40 days after calving, but normally produce only two calves every 3 years.

Buffaloes are lean animals with killing-out percentages ranging from 53 to 56%. They tend to be highly muscular, because they have been developed for draught purposes. Buffalo meat and beef are similar but the meat of buffalo is darker and the fat is always white. There is no evidence to indicate that the meat is tougher than that of cattle of a similar age.

Five per cent of the world's milk is produced from buffaloes. In countries such as Egypt, the milk yield of buffaloes is generally higher (680-800 kg) than that of local cattle (360-500 kg). The highest yield comes from Murrah buffalo (1800 kg per lactation). Calves of some types of buffalo are about the same size as a Holstein calf. They grow very quickly, because of the quality of buffalo milk, and can weigh 360 kg at 1 year old. However, many calves die in India and Egypt because the milk is used for human consumption and not enough is left for the calf. Buffalo udders are very variable in shape, making machine milking difficult. The presence of the calf is not normally needed to stimulate milk let-down as is the case of many zebu cattle.

Buffalo milk contains 16% total solids compared with 12-14% for cows. Butterfat percentage is 6-8%, compared with 3-5% in cows. Buffalo milk lacks the yellow pigment, carotene, and is therefore white. It can be processed in a similar way to cow's milk. To produce 1 kg cheese requires 8 kg cow's milk but only 5 kg buffalo milk; 1 kg of butter requires 14 kg cow's milk but only 10 kg buffalo milk.

Buffaloes are reputed to provide 20-30% of the farm power in South-East Asia. They are said to move easily through mud, because they have large boxy hooves, but are no better at working under paddy field conditions than cattle. Because of their limited ability to sweat, buffalo are not suitable for working under dry land conditions. They need to wallow after 2 h work to get rid of excess heat produced during work. They can walk 3 km h^{-1}, and can work for 5 h day^{-1}. At this rate of work they may take 6-10 days to plough, harrow and prepare 1 ha of rice paddy.

The domestic buffalo is a ruminant and the general structure of its rumen, reticulum and omasum is very similar to that of cattle. Therefore the nutrition of the buffalo is broadly similar to that of *Bos taurus* and *Bos indicus* animals. In most trials, buffalo have grown faster than native cattle (range 0.25-1.25 kg day^{-1}). This is probably because they have a larger mature body size. Some experiments have shown that buffalo digest cellulose more efficiently than cattle (e.g. straw fibre 80% vs. 65%). They may have different microorganisms, or proportions of them, in the rumen. However, other experiments show that cattle are more efficient than buffalo. They are often fed mainly on rice straw, maize stover or other similarly low-quality feeds. Lack of adequate nutrition, in both quality and quantity, is the main reason why buffalo are unproductive. For all practical purposes, knowledge of the nutrition of cattle can be applied to water buffalo, provided that differences in body weight and in the composition of the milk are taken into account.

Further reading

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