

## Lecture 2

### **DAIRY PRODUCTION SYSTEMS**

#### **(1) Extensive or Traditional system**

Under the extensive system, the producers are generally scattered among rural communities at some considerable distance from the urban centres. The stock used consists of a collection of cows sometimes goats and sheep. The cows are not selected for high milk production or any of the other characters derivable in a good dairy animal. Milking is not carried out at regular intervals and very often there is no record for milk produced by each cow. There are no cultivated pastures on which to feed the animals. The animals rely on grazing on the open range grounds with the change of seasons. In most cases, this development results in a very low level of production. The milk produced is not usually processed and the system requires thousands of milking cows to satisfy the requirement of the market.

#### **(2) Intensive (modern) system**

This system involves the use of dairy animals specialized for milk production. This involves the investment of considerable capital. The size of the dairy herd could vary from 50-100 cows for small scale operations and up to 500-1000 cows for medium size operator. The large scale operation has more than 1000 cows. The animal used for this operation are high yielding European type of breeds e.g. Friesian. In some of urban dairies in Nigeria, crosses of European breeds with indigenous cattle, selected indigenous cow are used in urban dairies in Nigeria. Breeding records are kept and selection for high milk yield is intensively carried out. The milk is regularly tested for quality and AI is used to improve the milk producing ability of the animal. The animals are fed regularly on cultivated pastures usually green soiled or zero-grazed. They are also supplemented with concentrates usually rationed according to production. The animals are housed and milking is usually done in a dairy parlour under hygienic conditions. There is a considerable degree of mechanization in most of the operations. The animals are subjected to regular veterinary inspection to prevent and cure diseases. Under this system of production, the farmer is concerned with making as much

profit as possible. The example of intensive system in Nigeria can be seen in the Urban Dairy Scheme at Agege, Iwo dairy, Kano, Maiduguri, Vom and Maizube Farms in Minna.



**Plate 1: Maizube Farms, Minna**



**Plate 2: Dairy Cows at the Maizube farms (Minna, Nigeria)**

## **BREEDS OF CATTLE USED IN MILK PRODUCTION**

In most temperate countries, milk comes mainly from domesticated cattle which have over several generations become specialized for milk production. In most tropical countries, on the other hand, milk comes from domesticated cattle as well as buffaloes, sheep, goats and sometimes camel. Buffaloes are used largely for milk production in India, Zaire, Sudan and Egypt. The contribution of buffaloes, sheep, goats and camels is just 20% of total milk production in the tropics. 80% milk comes from domesticated cattle.

### **Specialised Dairy Breeds**

These include Friesian, Brown Swiss, Jersey, Ayrshire and Guernsey (All of temperate origin). Friesian, Brown Swiss and Jersey were imported to Nigeria for crossbreeding with indigenous cattle in order to raise the level of production.

### **Holstein-Friesian**

It originated from Netherlands but it has spread to other parts of the world especially where emphasis has been on milk production. The colour is black and white or red and white. World's highest producing dairy animal. Holstein-Friesian is a cross between the black cattle of the Batavians (Holstein) and white cows of Friesian bred to produce the most efficient milk with limited feed resources. Calf weighs 41 kg or more at birth. Holstein cow weigh 650kg and 147cm tall. Heifers are bred at 13 months and weigh 363kg. Holstein-Friesian calves for the first time between 23 and 26 months of age. Gestation period is approximately 9 months. Average milk production is 10,443kg, 381kg butterfat and 321kg. Top producing Holstein milked twice a day produce 30,806kg milk.



**Plate 3: Holstein-Friesian Cow**

### **Brown Swiss**

This is the oldest of all dairy breed. It is brown in colour. It produces the second largest quantity of milk per annum, 9,000kg. MEkg is 9991kg, 397kg fat, 329kg protein. They have good milk, protein and fat production and have correct feet and legs that allow them to stay in the milking herd. They have one of the lowest somatic cell count averages of all dairy breeds with best fat-to-protein ratio coveted by cheese makers. Brown Swiss producers receive more for 45kg of their milk than milk producers from other breeds. They are noted for their dairy strength, longevity and reproduce longer than cattle of other breeds.



**Plate 4: Brown Swiss Cow**

### **Jersey**

**Jersey** cattle are a small breed of [dairy cattle](#) . Originally bred in the [Channel Island](#) of [Jersey](#). Jerseys come in all shades of brown, from light tan to almost black frequently [fawn](#) in colour. All purebred Jerseys have a lighter band around their muzzle, a dark switch (long hair on the end of the tail), and black hooves. Cow weight ranges from only 360 to 540 [kg](#). Bulls are also small, ranging from 540 to 820 kg. They are notoriously aggressive. High butterfat conditions, 6% butterfat and 4% protein, and the ability to thrive on locally produced food. A lower maintenance costs is incurred by its lower bodyweight, and superior grazing ability as well as its genial disposition. The cattle has a calving ease and a relatively lower rate of [dystocia](#), leading to their popularity in [crossbreeding](#) with other dairy and even beef breeds to reduce calving related injuries. High fertility. Jerseys are adaptable to hot climates and are bred in the hottest parts of [Brazil](#).



**Plate 5: Jersey Cow**

### **Indigenous Dairy Breeds**

Most of the indigenous breeds particularly, the Southern breeds offered no prospect for milk production due to poor performances in experimental stations. Nevertheless, some of the Northern breeds offer some prospect for milk production because of the available figures on yield as well as the large number of the breed e.g Kuri, Shuwa Arab, White Fulani.

### **Kuri**

The gigantic bulbous horns are an unmistakable trait of the Kuri. It is also called Lake Chad Cattle or Buduma Cattle. These cattle are native to the shores of Lake Chad where Cameroon, Chad, Niger and Nigeria join. The Kuri are believed to be descended from the Hamitic Longhorn cattle and have been herded by the Buduma and Kuri peoples for centuries. The tribesmen were strict in their selection of animals for their horns, many of which grow in a lyre or crescent shape. The horns sometimes reach 130 cm in length and 55 cm in diameter. Most remarkable is the unique pear shape of the horns.

These animals are kept as dairy cattle in herds of approximately 30 females with one bull. The animals spend several hours each day in the water swimming in search of water plants for food. It is thought that the horns act as floats. The cattle are acclimated to water to such a degree that they survive with difficulty away from their indigenous area. They are easily affected by the sun if unable to bath. The Kuri are tall for an African breed, with a long back, shallow body and a large, bony rump. The legs are strong, long and bony with large, widely cleft hooves. Kuri are usually white in color. The females are 135 to 145 cm in height and average 400 kg in weight. The bulls range from 152 to 180 cm and average 475 kg of weight. Some males will reach 600 kg.

The breed has been known to produce reasonable amount of milk and records from Maiduguri show the average of 6 lactations was 1,259kg in 280 days. Highest individual yield is 2,440kg in 314 days. The cows yield 4 litres of milk a day after nursing their calves. The Kuri as at present is confined to Lake Chad environment.



**Plate 6: Kuri Cattle**

#### **Shuwa Arab (Wadara Cattle)**

This is found in North East part of Nigeria. Wadara cattle are medium-sized, lightly built cattle, and are usually dark red, black, pied or brown. They are short-horned and have a small erect hump, representing some 6.6% of the national herd. Wadara cattle are the 'indigenous' cattle of Borno and are referred to by the Koyam and related pastoralists as 'our' cattle. They are frequently called 'Shuwa' in the literature, after the Shuwa Arabs who also herd them. A related breed with a white coat, the Ambala, is often traded into Nigeria from Chad. In its natural

environment, it is used as dual purpose breed i.e. for milk and meat. Average age at first calving is 45 months. Average breeding life is 7 years. Average milk yield of 23 lactations was 1,305kg. Highest performance was 3,421kg in 305 days. The Shuwa Arab offers some prospect for selection for milk production because of available figures on its performance as well as large numbers of breed.



**Plate 7: Shuwa Arab Cattle**