

## Clean milk production

Clean milk production is very essential to improve the quality of milk produced from dairy farm and to reduce the udder infections and mastitis incidence in dairy cattle.

1. Wash the cows before milking
2. Dry the udder with a clean towel before milking
3. Use full hand method of milking or milking machine. Avoid striping method or knuckling method of milking as it causes damage to teat.
4. After every milking dip the teat with antiseptic solutions example of commercially available teat dip/spray solutions are, MASTINIL SPRAY, SAAF-KIT, etc...
5. Use narrow neck containers (milking pail) for milking to avoid the direct fall of dirt during milking
6. Use ergonomically designed revolving stool while hand milking

Revolving stool for milking	Narrow neck milking pail	Antiseptic teat spray/dip	Single cow milking machine
			
			

### Machine Milking

Modern milking machines are capable of milking cows quickly and efficiently, without injuring the udder, if they are properly installed, maintained in excellent operating conditions, and used properly. The milking machine performs two basic functions.

1. It opens the streak canal through the use of a partial vacuum, allowing the milk to flow out of the teat cistern through a line to a receiving container.
2. It massages the teat, which prevents congestion of blood and lymph in the teat.

#### Advantages

The advantages of this milking machine are manifold. It is easy to operate, costs low, saves time as it milks 1.5 litre to 2 litres per minute. It is also very hygienic and energy-conserving as electricity is not required. All the milk from the udder can be removed. The machine is also easily adaptable and gives a suckling feeling to the cow and avoids pain in the udder as well as leakage of milk.

#### Milking machine

1. A calf and the machine- similar fashion
2. Tongue, Dental pallet and jaw movement of the calf by the inflation tube, pulsator and vacuum pump.
3. 352mm Hg- Cattle
4. 400mm Hg in Buffaloes

#### Machines for milking buffaloes

Since the udder and teats in buffaloes are different compared to cattle, milking machines for cattle have to be modified in order to fit buffaloes. In general, a heavier cluster, a higher operation vacuum and a faster pulsation rate is required. Results from recent studies in India indicate that it might be possible to reduce the cluster weight and the frequency of liner slip by applying an appropriate combination of liner design and cluster weight.

It is not only the total weight of the cluster that is important, but also the distribution of its weight on

the udder. Unequal weight distribution can cause uneven milk output. The long milk and vacuum tubes should be aligned and stretched to ensure equal weight distribution of the cluster on the udder.

Milking characteristics depend upon vacuum levels and pulsation rates among others. Studies on Egyptian buffaloes revealed that a vacuum of 51 kPa and a pulsation rate of 55 cycles/min led to much longer milking times than a vacuum of 60 kPa and a pulsation rate of 65 cycles/min (6.21 min. compared to 3.18 min.). The higher vacuum level, however, caused a significant increase in the somatic cell counts. Highest milk yield within an acceptable time were found when using 56 kPa and 65 cycles /min. In all trials a pulsation ratio of 50:50 was used. Studies in Pakistan indicated that the pulsation rate and ratio should be 70 cycles/min and 65:35 respectively for Nili-Ravi buffaloes. In Italy, the majority of farms use the same machines for both buffaloes and cattle. It is a simple "cattle machine" with one vacuum level operating at approximately 40 cm Hg.

In India, recent trials have been made with milking with Duovac TM from Alfa Laval Agri. Successful milking was done with a vacuum level of 55 kPa, 70 cycles/min pulsation rate and pulsation ratio of 65:35 for milk flows above 0.2 kg/min. For milk flows under 0.2 kg/min the respective data were 38 kPa, 48 cycles/min and the same pulsation ratio. The Duovac TM is physiologically correct for the animal since it helps in gently stimulating let-down and is also gentler to the teats after the peak flow.

### **Milking with machines**

In order to obtain all the advantages with machine milking the correct technique must be used. The milkers and buffaloes must be familiar with the machines. If the buffaloes are scared or feel uncomfortable they will withhold the milk and thereby yield less. This in turn will lead to economic loss for the farmer and eventually he will lose his faith in machine milking.

### **Introducing machine milking**

the concept of machine milking should be introduced slowly and by persons who the buffaloes are used to and feel comfortable with under the supervision of an expert from Alfa Laval Agri.

The procedure of introducing buffaloes to machine milking presented below is recommended by Alfa Laval Agri and is applicable for a whole herd where neither animals nor humans are familiar with machine milking. By carefully following the mentioned steps, a successful introduction should be possible.

- Training of personnel. Training of milkers should be done by a person from the milking machine company. This person has good knowledge about biology of milking, machine milking as well as with the design, function and maintenance of the milking equipment. The training should include introduction procedures, milking routine, handling of the machine, cleaning and maintenance as well as certain aspects of the day-to-day service of the machine.
- Installation of the milking machine in the barn and any other modification in the barn should be made well in advance of the changing to machine milking.
- It is most appropriate to start with heifers since it is easier to habituate heifers than older buffaloes to machine milking. Older buffaloes may have been hand milked by a certain routine for several lactations and may respond negatively to a change in routine. Heifers on the other hand are not accustomed to any specific routine and are more likely to accept machine milking as well as hand milking. Furthermore their udders and teats are more uniform and not damaged by previous milking. Liner slip and other negative effects of machine milking is therefore less pronounced in heifers. Note that heifers should not be hand milked but directly introduced to the machine. They may get accustomed to the noise of the vacuum pump etc. by participating in the milking routines prior to partus
- Calm animals that are comfortable with hand milking should be selected. The udders and teats of the animals should be uniform with respect to conformation and size. Buffaloes in heat or unhealthy animals or animals with previous let-down-problems should not be selected.
- Milk the old and selected animals as usual by hand but let the vacuum pump run during milking. This will make the animals accustomed to the noise. Put the pump on before actual milking, but after the buffaloes have been tied up, otherwise the animals may be startled by the sudden noise. Repeat the procedure (usually 2 to 4 times) until all buffaloes are accustomed to the noise. It is better to repeat this procedure once or twice more until all buffaloes are

- comfortable, than rushing into the next step.
- Bring the milking machines into the barn. Connect them to the airline and place them at each buffalo's place at the same time as hand milking is carried out. This will allow the buffaloes to get used to the "ticking" sound of the pulsator. It will give them a chance to look at the machines and smell them and may be even taste them. Make sure though, that they do not chew on them! Move the machines to the next buffalo in order to be milked. This makes the buffaloes used to machines being moved around. The procedure should be repeated (usually 2 to 4 times) until all the animals have accepted the presence of the machines.

At this stage, presumably all buffaloes will be well accustomed to the new routine. If some buffaloes are still showing signs of nervousness or stress, it is recommended to repeat the above mentioned steps until the animals are calm. Buffaloes that after this procedure have not accepted being milked by machines should be returned to hand milking. One or two frightened or uncomfortable buffaloes might cause major disturbances in the whole herd.

Consistency with respect to milking routine including pre-milking preparation should be applied from the beginning of the introduction period. The regular milker should carry out the machine milking during the introduction period.

When the cluster is firmly attached to the udder, the milker should stay with the buffalo to see that she is comfortable. Soft talking and brushing and scratching are the best ways to calm an animal. These first sessions of machine milking usually require longer time than the following. However, this time is well worth spending to assure forward calm and easy-milking buffaloes.