The milk let down reflex stimulates milk flow from the alveoli in the udder into the teat canal. It has to occur before a cow will milk out freely. A cow which has ‘let down’ prior to cup attachment will milk out faster, and in many cases, more completely, as long as the let down does not occur too long before cup attachment as this can slow the milking process. The let down reflex can be inhibited resulting in slow or interrupted milking of cows.

**Benefit**

**Maximise production**

- Cows that let down just prior to cup attachment will milk out more completely thus maximising production.

**Improve milking efficiency**

- An understanding of how milk let down occurs will help milkers manage the milking process in a way which encourages it.

**1.1 Milk let down**

Milk is initially secreted into small sacs within the mammary gland called alveoli, from which it must be ejected for consumption or harvesting. Mammary alveoli are surrounded by smooth muscle (myoepithelial) cells which are a prominent target cell for oxytocin. Oxytocin stimulates contraction of myoepithelial cells, causing milk to be ejected into the ducts and cisterns above the teat.

Oxytocin is released after the cow receives an appropriate stimulus, this can be visual, aural or physical, and should be predictable and consistent at every milking. Handling/massage of the teats for at least 15 seconds is a strong stimulus, but cows can also learn to let down through the association of the dairy environment to the milking process.

The pressure of milk being forced into the ducts/cistern and down towards the teat causes the teat to swell with milk and become ‘plump’. It takes 60 - 90 seconds for teats to become plump after let down has been initiated. Cows with well-filled udders require a shorter period of stimulation to elicit a milk let down response than cows with less-filled udders.

The action of oxytocin is essential for emptying of the udder during milking. As much as 80% of a cow’s milk is unavailable if this oxytocin release is insufficient or does not occur. Its let down action lasts for about 5 minutes and is strongest for the first 3 minutes of milking. It is important to get the cups attached quickly after let down has started to make full use of the increased udder pressure that occurs.
Figure 1. Anatomy of a teat.
Source: Dr Tyler, Iowa State University.

1.2 Factors which inhibit milk let down

Slow milking time and incomplete milking out are indicators of interrupted milk let down.

- Agitated, fearful or stressed cows produce the hormone adrenaline which counteracts the activity of oxytocin and inhibits let down. It may take 20-30 minutes for the effects of adrenaline to subside.

- Pain during the milking process will affect milk let down. Ensure any udder conditions are treated and milking machinery is not hurting cows.

1.3 Indications of a problem

If any of the following are occurring then you may have issues that you need to address:

- There is no milk flow when the cluster has been attached for greater than 2 minutes in late lactation, sooner in early lactation.

- Cows that are agitated during milking.

- The milk flow is ending when there is still a significant amount of milk in the udder. The flow can be interrupted part way through milking. In this case the milk flow at the start of milking is residual milk left in the cistern from the end of the previous milking and not milk which has been let down at this milking.

- Damage to the teat end (hyperkeratosis) (see Figure 2).
Figure 2. Damage to the teat end. This can be caused by over-milking due to poor milk let down.

**Suggested improvements**

**Actions to take**

Minimise all factors which can create stress or discomfort for cows during milking such as, for example:

- Inconsistent milking routines.
- Bad pipework design or maintenance which hurts cows.
- Poor machine set up or maintenance.
- Poor animal handling techniques such as hitting cows or twisting tails, aggressive yelling or very loud music.
- Animal health problems e.g. mastitis, lameness.
- Stray voltage (although this is uncommon).

Consider:

- Carrying out a teat preparation routine for cows which are slow to let down (e.g. teat washing and drying or massage) as it is a strong stimulus for let down.
- Check for interrupted milk flow in a rotary by going back around about 10-20 cows from cup attachment, depending on the size of the platform, or by going back down the line about 10 cows in a herringbone and checking the sight glasses. You should see a milk flow if let down is good.

**Action points**

- Make sure there is nothing about the milking routine which could scare or stress cows and inhibit oxytocin release.
- Encourage a relaxed and consistent milking routine.
- See information on animal behaviour. Understanding how cows behave helps people to work with them without causing stress.