

Drafting system components

The components of an automated drafting system are: a race, sorting gate and identification system and a controller.

Cow identification

Cows need to be identified with EID (electronic identification) for an automated drafting system to work. It is important that the EID requirements of the drafting system are compatible with those of other automated activities in the dairy if the full potential of the system is to be realised.

Different systems may use different identification processes, with some requiring each cow to stop for accurate identification and others allowing a constant walk-through with cows being identified as they pass by. The type of system will affect cow flow from the dairy.

System controller

The system controller may be a computer (separate “processor”) or programmable logic controller (PLC). When the drafting system is integrated with the whole herd management system, a single controller can be used for all automated activities.

Integration with the herd management system allows cows to be drafted automatically on pre-set criteria. Information can be collected from the cows automatically (e.g. information from a milk metering system or cows detected in oestrus through the use of pedometers) or be typed in manually (e.g. cows scheduled for vet checks or follow up treatments).

Many systems allow the drafting criteria to be tailored for the farm, thereby allowing individuals, groups of cows or any cow meeting a particular criterion to be drafted. This feature is handy because it can remove or reduce the need to program the drafting requirements just prior to each milking.

Recent advances include the use of hand-held computers to record information in the paddock that can then be up-loaded automatically to the system controller prior to each milking.

Gate design

Several gate designs can be used in automated drafting systems e.g. single gates, where one gate is moved to switch the cow path from exit to holding pen, or twin gates where two gates are moved in counter directions to switch the cow path. Both of these options can be utilised with success.

Smooth cow flow through gates can be ensured by good gate design. The angle a cow has to turn through a gate can be minimised by using a system which causes them to veer to a lesser degree than the traditional ‘straight-ahead’ or ‘out-the-side’ options (see Figure 1).

The drafting gate needs to be designed to stop cows forcing the gate and prevent cows getting jammed. It must also activate fast enough to draft the desired cows without catching those not required. These features often require adjustment after installation on individual farms.

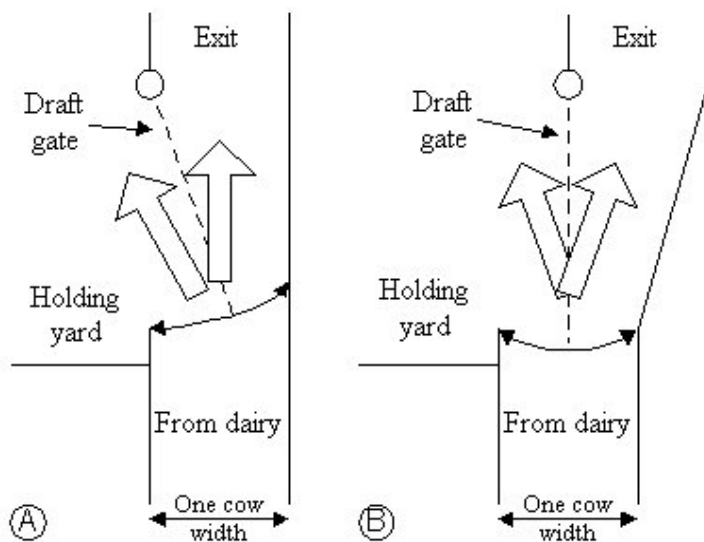


Figure 1. In the left side-draft diagram (A) the drafted cow must turn 30° to enter the holding yard. In the right diagram (B) all cows veer 15° with a left veer for drafting or a right veer for exit.

Operating requirements

Some form of energy is required for the activation of the gate, whether it is controlled by a system controller or by the milker. Electricity, air, vacuum, pressurised water or hydraulic oil systems can be used. Different drafting systems will be designed to use particular energy sources. It will be necessary to ensure that a suitable drive can be provided for the drafting system and that the controller can communicate with the drafting unit.

Drafting sequences

Not all automated drafting systems use the same sequence of events to draft a cow. Electronic 'eyes' can be used to detect cow position within the system and blocking gates may be used to prevent following cows from entering the drafting unit until the drafted cow is clear.

Blocking gates can (but not always) interrupt cow flow, as can noisy operating actions and poor directional visibility. Cows like to use sight to follow one another so drafting gates should ensure good forward visibility to encourage cow flow.

Other considerations

The drafting system may operate at one of a number of levels, from manual to fully automatic, depending on the options installed. The unit should be equipped with a manual override to allow milkers to take control in the unlikely event of a malfunction. Drafting of non-programmed cows should be via the milker entering the cow's number with a keypad – preferably in the pit.

Manual operation of automatic drafting systems should not be considered to be a regular event as it will tempt owners to install the system near the dairy where milkers can see what is happening. Activity in the milking shed tends to distract exiting cows which can disrupt cow flow and the drafting process.