Cow ID-topics related to milking and milk recording

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Core value of any registration, whether manual or automatic, is to monitor, control and validate ID. Observing a car running way too fast does not help anyone if numbers and letters on the plate cannot be read. In the same analogy, it doesn't bring the police any further if there is a false ID on the car, or if numbers were made up.

The same counts for using ID systems in animal husbandry. To ensure correct and true data, it is essential to have firm routines and technology to catch cow ID.

Data is only valid and relevant when linked to an ID

As throughput of cows per time unit increases with larger groups in milking parlours and more automation and constant measurement on a series of parameters moves on to the farms, it gets more and more important to highlight the cow ID topic. Most new milking parlours have rapid exit systems speeding up the process of changing the group being milked to the next group in order to increase the milking capacity of the milking parlour. Many parlours nowadays are equipped with ID at the entrance of the milking parlour (walk-trough ID) – saving costs compared to an ID system at every bail.

Cow ID and data is an issue of great concern

In an ideal world the cow is registered at the entrance of the parlor, and software links the cow the right position in the parlor. Finally, data from the cow and the milking flows directly to a database.

Manufacturers often focus on their products ability to read ID when cows pass the antenna. In marketing this is most times expressed as very close to 100%. What seldom is told, is the ability of the system to link cows to the right bail, which is what users of data expect to happen. And taken for granted.

Besides collection of the data mentioned above, the same system is also used to link the sample ID to the Cow. Regarding taking samples, it might happen especially in side by side parlors, that milk meter and sampling device are mounted left or right from the cow, with other words below another cow. However, by correct identification from the meter/sampler and good instructions to the milk recording technician, this can be dealt with. In general it can be concluded that wrong cow ID also will affect the sampling. A good sample can be collected, but when connected to the wrong Cow ID, the data are useless.
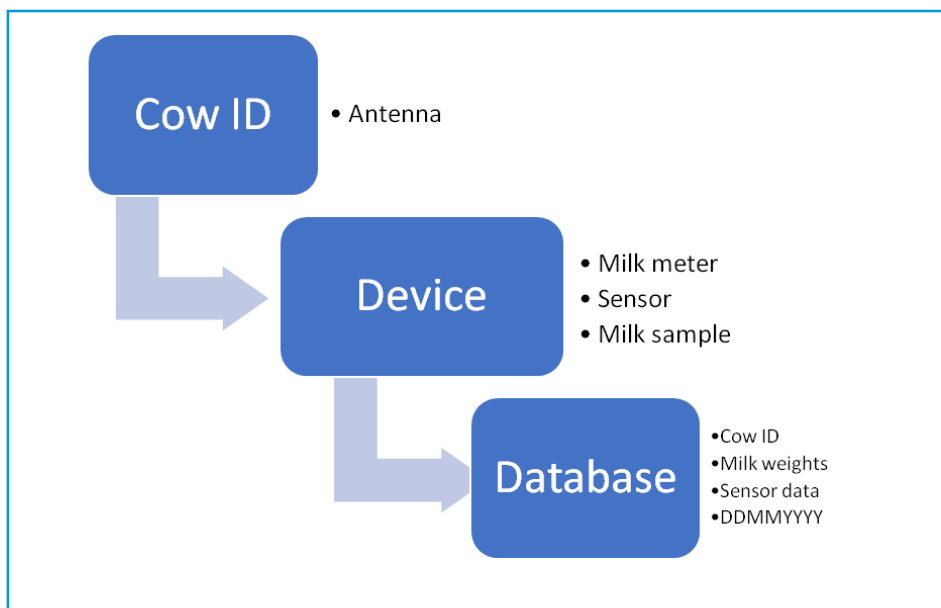
Figure 1. Data from the cow and the milking flows directly to a database (Figure 1).

What can go wrong?

In the everyday situation on a farm, several steps can go wrong with major effects on the quality of data collection. A list of examples is listed below.

Software from various manufacturers

During milking there is only a few seconds to determine cow ID, sequence in the row, link to a bail # and start recording. Especially in large milking parlors (up to 2 times 35 side by side rapid exit parlors) there is very limited time for the first step – determination of the cow ID. If time is too short, it might happen that a cow ID is not measured at all when cows enter, or sometimes when 2 cows are very close to each other, only 1 is identified. The order of cows ID identified is linked to the bails in the milking parlour. So the first cow identified is linked to bail 1, 2nd to bail 2, 3rd to bail 3 and so on.

However, when a cow is not identified, there will be no link to the bail. So if cow at bail 10 in the row is not identified, cow 11 will automatically be linked to bail 10, cow 12 to bail 11 and so on. This will result in one cow not identified and a number of cows linked to the wrong bail.

Most manufacturers have built in options to correct any observed error or mismatch between cow and bail. Often the milker plays an important role in adjusting the cow ID to the right number, however he or she has to see (or g*et al*erted) that something went wrong. To avoid a discussion who is better than others, no brand names is mentioned below.

Errors and the damage these mistakes cause, is slightly different between parlors and rotaries. In parlors one missed cow can result in a full side only errors. On a rotary, errors are in most cased isolated to relatively few cows and bails (normally max 2-3).

Main issue is to avoid cows from backing out of the reading area. This will typically happen for the last part of the row, new cows especially heifers and when sudden noise or abnormal routines is detected by the cows. As explained there are several options delivered by manufacturers.

What to do during milking – Parlors

Alarm

- A light alarm goes in the event the parlor gate is closed and less than a full side is identified.

   The reasons can be:

   - Missed cow. The milker must compare display and identify cows in the row. Correction is made on the panel following instructions and guidance as put forward by the manufacturer. Successful correction depends on the milker.

   - The side is not full. Check for errors as above, correct and/or accept data as they are.

If alarms are left unattended, and cows are not identified, is several cases depending on the manufacturer, these cows will get a calculated milk yield for this milking based on previous milkings.

System A lock cow ID in the moment back gate is closed. From there, no further options to correct ID

Locking of data – no correction possible

System B lock cow in the moment first set of cups is activated. From there, no further options to correct ID

Manufacturers software is to some extend built to deal with errors. A couple of examples below.

Correction of data, an example

System X

Some cow's in a row are not identified. identified. After milking the system pools let's say 5 missing cows in one batch and 5 homeless milk yields in another batch. Based on previous milkings these 2 sets of data will be merged, and a homeless milking with 15 kg, will be added to the file of a cow that likely could have had this amount.

This way of dealing with the subject of missed reading at the entrance, seems on the surface to be pretty smart. Digging into it, it soon reveals that what is looking as a 1 cow error, suddenly shows to be a full row error, because one cow not identified leads to several cows linked to the wrong stall number

System Y

After each milking cows expected to be milking, but not seen, will be subject to a data examination to set an estimated milk yield.

In Denmark we have seen cows in example Y, who for several months did not have a real recording from the meter. Every single milking was predicted.

Help to avoid errors

Some parlors are equipped with a "cow counter". This counter helps to identify number of animals passing the antenna. The counting will correspond with the antenna and leave a "no ID" on the bail where the ID was missed.

This system helps as a backup system but cannot detect everything happening during milking.

Main reasons behind errors

The following examples is from time to time observed in Denmark and Holland:

- Cows without electronic ID.
- User/milker not familiar with the system.
- Cows are pushed from holding pen to parlor.
- Cows passing each other after identification, but before reaching milking point.
- Identification of a cow number in other lane (ID reader not protected quite well).
- Malfunction of installation.
- Lack of maintenance of electronic installation.
- Electronic noise coming from other sources (blowers, LED light etc.).
- Poor installation of electronics and wires. In DK quite a few examples where very basic rules for protection of wires, engines and connections has not been met.
- Any other .....

At the Dairy Campus facilities many selection gates (walk through ID) are used to guide all cows after milking to the right barn and group. The number of correct identifications is now around or above 99%. Just after installation we had variable ID rates from 95 to 98%. Several of the solutions mentioned above were applied to increase accuracy rates.

By mounting Texas gates at the electronic weighing unit positioned at the exit of the rotary, the number of missing readings was also heavily reduced (mix of correct ID and time to weigh the animal).

We know a goat farm in the Netherlands who mounted individual ID antennas at every bail while to his experience identification at the entrance resulted in too many faults (just one example).

A general and well covering reason for errors is that in most situations milkers do not have the time needed to constantly monitor and correct errors.

What to do during milking - rotaries

Milking in a rotary is more "cow oriented" than "row oriented". The milker will immediately notice an empty bail and by experience know there might be a mismatch. Reasons why still things can go wrong:

- Cows without electronic ID.
- Cow expected to walk into bail 1, missed it and end up in bail 2.
- User/milker not familiar with the system.
- Cows passing each other after identification, but before reaching milking point.

- Malfunction of installation.

- Lack of maintenance of electronic installation.

- Electronic noise coming from other sources (blowers, LED light etc.).

Some installations do have cow ID at every bail (like the Dairy Campus rotary), most however do have a Texas gate connected to an ID antenna and the milking platform. This gate is the key to link the right cow to the right bail. If the Texas gate is turned off and cows have direct access to the platform, ID validation does not work either. This also will cause mismatch of cow/bail relation. Some farmers and milkers disconnect the gate to speed up cow traffic. The result will be inaccurate data. Another reason to disconnect the gate, is simply to avoid the noise from airoperated valves and metal scratching when gate opens and close. In some installations it can be a quite frustrating and intensive noise level.

A general and also well covering reason for errors is that in many situations milkers do not have the time needed to constantly monitor and correct errors.

To give an idea, a one-man operated rotary (40 units) will run approximately 180 cows per hour – this is only 20 seconds per cow to do all the things necessary around milking.

Where the antenna is placed

On rotaries antennas can be placed differently.

- Connected to a Texas gate (1-2 meters behind the platform).

- Just outside the platform ("cows last step before jumping").

- Any of the above combined with an antenna 3-5 bails after entrance for validation of cow ID.

- Antennas mounted at every bail.

Final comments

The above information's and views are based on sporadic observations plus observations reported by our field- and validation staff. It is not easy to estimate the number of wrong data in the field but estimated on those sporadic observations and the number of faults resulting in bad quality data might be somewhere between 5 and 15%. However as said real field data are missing.

Examples and details are not necessarily fully covering the whole area.