

BRIDGING THE GAP

Combining automatic milking and grazing successfully

Grazing and robotic milking are often considered as incompatible. However, results from the experimental farm of Derval (located in the Northwest of France) prove that it can be a successful match. When climate conditions are good, the ration can even go to all-grazing, resulting in a clear reduction of production costs. To achieve this, good management is crucial: cow traffic must be observed carefully, as well as grass growth. Two critical success factors need to be considered: the distance of the robot to the pasture and the number of cows that the robot has to milk.

The system at Derval

An efficient herd despite the capacity of the robot

At Derval, on average 741,000 litres of milk are sold annually, produced by top cows each producing 9,500 kg on average. Calvings are spread throughout the year to keep the number of cows constant. Every day, on average 145 milkings give about 2,160 litres.

The robot is working to its full capacity, with 73 cows at any time. Milking takes approx. 20 hours, and remaining hours are dedicated to cleaning the robot and the surrounding area, and by cows coming in, coming out, standing in front of the robot... To minimize the wasted time, cow traffic is guided by a selective door so that only cows that need to be milked are able to access the robot.

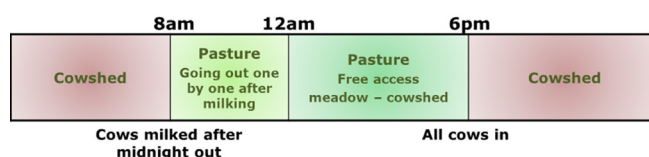
Pastures fitted to the system

The total pasture area of 28 hectares is close to the dairy unit, with no roads to cross. For each cow, 0.4 hectare of pasture is available. To maintain a simple pasture rotation, only 3 meadows were designed: 1 of 8 hectares and 2 of 10 hectares. The cows need to



walk for 400 metres to reach the furthest pasture. A mixture of perennial ryegrass and white clover is used to provide good grass quality. These assets allow an optimal use of pasture, with a minimum of 1 ton of grass eaten in pasture per cow per year. The maize silage silo is kept closed as long as possible.

Working with a transition period



To avoid digestive problems, cows need a transition period to go from a 100%-maize ration (over winter) to a 100%-grass ration.

During this 4-week transition period, cows go out only during the day: they are put out to pasture after they are milked at 8 am, and are brought back in at 6 pm. Also, the maize silage ration gradually decreases from 17 to 5 kg DM per cow per day.



After this transition period, cows are in pasture day and night, and are only brought in to be milked. To have the cows milked at night, the farmer has to bring them back at 6 pm, and they then go out one by one after they are milked. This way 35 milkings are conducted between midnight and 6 am, making full use of the robot's capacity.



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Technical and economical results

	Cowshed (60d)	Transition period (74d)	100% grazing (32d)
Number of milkings (/d)	149	141	138
Milking frequency (/cow/d)	2.06	1.92	1.86
Production (kg/cow)	29.4	31.6	27.6
Maize silage (kg DM/cow/d)	17.1	9.4	0
Rapeseed (kg/cow/d)	3.6	1.8	0.5
Wheat (kg/cow/d)	0.3	2.1	2.0

Milking frequency decreases as the proportion of grass increases. Indeed, cows eat and sleep in pasture; they come back only to be milked. Depending on how far the pasture is, some of them, especially those with leg problems, are not milked as often as they would be if they were in the cowshed. Compared to winter results, milk production is higher during the transition period and lower during the all-grazing period.

However, these differences also need to be considered in connection with the production cost. If more grass is included, the ration becomes cheaper. The consumption of concentrate goes from 150 g to 90 g per litre of milk. Maize silage and rapeseed can further be saved by the addition of wheat. As a result, producing 1,000 litres of milk in an all-grazing period costs €24, compared to €76 during indoor feeding. Production costs were thus in this situation divided by 3.

PRACTICAL RECOMMENDATIONS

Marc Fougere, Derval KTC farm manager

- Let the cows graze as soon as the soil is dry enough.
- Slowly increase the proportion of grass to avoid health problems.
- To avoid waste, never leave maize silage silo open if less than 5 kg DM/cow/day is given.
- Always have a quantity of grass in pasture that can be eaten by the cows in 10 to 15 days. If less, add some maize silage; if more, cut some grass to be conserved.
- In rotating pasture, put the cows in another meadow when their milk production decreases by 10% or when they have eaten 55% of the initial grass height.
- Do not forget that bringing in cows is unavoidable once a day, but that this is a good opportunity to keep an eye on grass quality, on fence conditions, and on the water supply.



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