Lycée Technique Agricole

Monitor feeding to improve a pasture based dairy production:

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Adapt weekly farm walk to Luxemburgish grazing conditions

Summary

The aim of the innovative measure is to adapt and combine existing grazing monitoring tools (feed wedge; pasture ruler) to Luxemburgish grazing conditions. This should maximize intake of low cost pasture, minimize supplementation and pasture residues and so increase grazing efficiency. The positive effects of grazing on economy, ecology and animal welfare will be enhanced and dairy grazing will persist versus the forthcoming main stream dairy indoor system with maize and concentrate based feeding.

Background

In Luxembourg 50% of the agricultural surface is grassland, mostly permanent. Since 1980 Luxembourgish dairy production progressively changed from a pasture based to an indoor feeding with grass and maize silage. The grazing understanding disappeared. So actually farmers do not use their available pasture efficiently. Cutting grass is mostly privileged to grazing. When grazing is practised, high amount of supplementation leads to an inefficient use of the available pasture with high residues, degradation of grass swards and high maintenance labour.
Increasing the milk quota and herd size with limited available pasture close to the milking parlour makes pasture alone diets impossible. Determine the exact amount supplementation to guarantee milk production and high pasture intake is the key factor for an efficient use of grazed grass.

3 STEPS to manage pasture

Step1: **Measure weekly the grass cover** by a weekly pasture walk with a rising plate meter (RPM) or a feed reader (FR).

Step 2: **Draw weekly the Feed Wedge** (grass wedge) by EXCEL TOOL FEED WEDGE:

Step 3: **Decide weekly the amount of supplementation** by EXCEL TOOL PASTURE RULER:

3 TOOLS to manage pasture:

TOOL 1: Rising Plate meter (RPM; Farmworkssystems, NZ)

The rising plate meter consists of a thin plate connected to a scaled shaft to read out of compressed grass height. As the RPM is lowered into the pasture, the plate is supported at a measurable height determined by the sward's density and height.

Alternative: Feed reader (FR; Farmworkssystems, NZ)

The Feed Reader (figure 1) is a reading sensor mounted to the front of quad. The ultrasonic head (A) reads the pasture height and measurements are recorded and stored by a terminal (B) which is connected to a GPS. The weekly farm walk is eased and quickened but accuracy of collected is lowered compared to RPM.

Figure 1: Feed Reader with ultrasonic head (A) and terminal (B).

TOOL 2: FEED WEDGE

Feed wedge excel (figure 2) tool has been adapted to Luxemburgish grazing condition with mostly a deficient pasture cover.

TOOL 3: Pasture ruler (figure 3)

The pasture ruler (Excel tool) allows determining the exact amount of supplementation according to the milk yield (horizontal red line; 25 kg milk/cow/day) and available pasture (descending green line; 8 kg DM pasture/cow/day resulting from the Feed Wedge). The corresponding ascending red line determines the supplementation needed to feed the cows (11 kg DM/cow/day)

Results

During grazing season 2012 and 2013 pasture covering was measured weekly with the rising plate meter (2012; 4 farms) or the feed reader (2013; 2 farms). A feed wedge and supplementation and paddock rotation advice was weekly communicated to the farmers.

At the end of the grazing period a farmers grazing performances were analyzed (figure 4). Pasture intake can be adapted to a measured pasture cover by RPM or FR using the Feed Wedge and pasture ruler tools. Milk yields can be maintained all over the grazing season. The exceptional strong spring and summer drought (2011) could so be managed. The farmer has to accept to change the level of supplementation weekly. This shows to be very efficient the mange the unpredictable grass growth, especially in a Luxembourgish situation where available pasture is deficient.

The feed reader measurements give the identical results. Measured data are less accurate with more expensive equipment, but less time consuming. Staff preferred running a quad to walking with the RPM.

The weekly pasture walk is the most disconcerting part to monitor grazing. The acceptance of this step by the farmer is decisive for to implement the method into Luxemburgish farming practice.

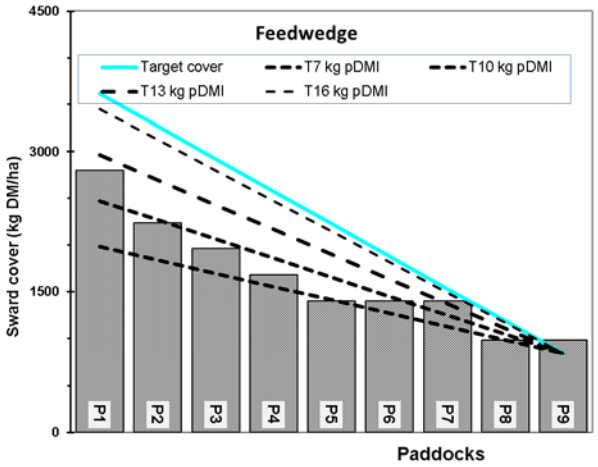

Figure 2: Feed Wedge Graph with bars for each paddock cover (P1; P2; ..) and target coverage lines (T7, T10, T13, T16)

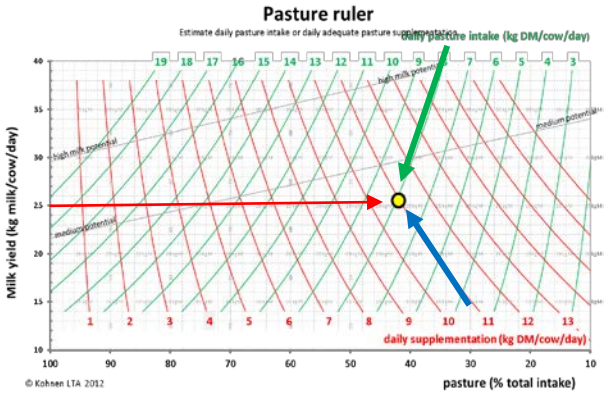

Figure 3: Pasture ruler (red line: daily milk yield; green line: available pasture; blue line: needed supplementation)

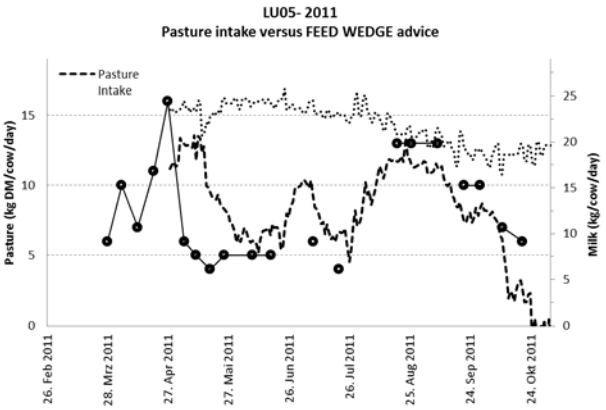

Figure 4: Evolution of milk yield (dotted line), available pasture (dashed line) and pasture intake (solid line)