In-line Milk Analysis: Key in Daily Dairy Farm Management Decisions

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Milk in a dairy cow reflects its physiological condition

AfiLab™ measures milk composition for each cow, during every milking

AfiLab™ data reveals metabolic disorders and feeding alterations, accordingly response time is shortened and damage reduced.
Utilizing AfiLab Milk Component Data

✓ Monitoring energy balance statuses

✓ Nutrition monitoring & precision feeding

✓ Udder health & Milk quality
Monitoring EB status - Herd Health and Fertility Management

- Early diagnosis and treatment of ketosis
- Improving of lactation curves
- Competence for insemination and pregnancy
- Health monitoring along pregnancy
Milk production is the cow’s top priority

Feed intake < Energy requirements

Negative energy balance (NEB)
The Challenges of the Transition Cow

- Food Consumption
- Milk Production
- Body Fat Mobilization
- Milk FPR
- Fatty Liver
- Production
- Reproduction

BW at Calving
Ketosis & Milk Fat-to-Protein Ratio Relations

The differences (180 days yield) between Ketotic and non Ketotic cows

9679 ketosis events out of 42355 lactations

fat, kg  protein, kg

+7.7%  -2.6%

Oded Nir–Markusfeld, 2012
Ketosis & Milk Fat-to-Protein Ratio Relations

180 days milk yield loss (kg) for various risk factors compared to cows with “no factor”

300,000 (>2nd) lactations of 160,000 cows (2002 – 2010)

- dystocia
- FPR>1.4 (17%)
- ketosis (13%)
- uterine disease

From Nir – Markusfeld and Ezra, 2013

Israeli Herd-Book data
Different Patterns of Herd Energy Status

Cows with NEB in milk tests

% with fat/protein > 1.4

- 1\textsuperscript{st} lact.
- 2\textsuperscript{nd} lact.
- ≥3\textsuperscript{rd} lact.

DIM

Oded Nir–Markusfeld, 2011
Time Differences Between BHBA and FPR

Blood BHBA & Milk Fat/Protein Ratio (cow 2496)

Schcolnik et al, 2007
Blood Ketone Changes During a Day

Schcolnik at al., 2012
Manual cow-side ketone tests as part of routine postpartum examination?

- Different herds have different metabolic patterns
- Ketone levels in different body fluids increase at different times
- No definite time for effective ketone measurement during the day
- Costly and requires manual labor
- Additional stress for postpartum cows
Diagnosing Ketosis Using AfiLab Data

- 4 field trials (commercial dairy farms 700-900 cows)

- cows were tested 4 times a week for ketosis (rates were 14-38%)

- “gold standard” Serum BHBA >1.4 mmol/L

<table>
<thead>
<tr>
<th>Model</th>
<th>Fat/protein ratio</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>High</td>
<td>55%</td>
<td>85%</td>
</tr>
<tr>
<td>B</td>
<td>Low</td>
<td>85%</td>
<td>55%</td>
</tr>
</tbody>
</table>

Schcolnik et al, 2006-2012
Using this combined model, farmers get a daily list of cows (5-45 DIM) to treat for ketosis.

![Image of cows with different colors and numbers]
Why should we worry about cow 919?
Cow 919 is suffering from ketosis according to AfiLab almost from calving time.
Comparison between 919 lactations shows 2nd lactation crashes and difficulties in 3rd and 4th lactations!

5th lactation
Culling reason "Bad body"
Daily Milk Composition Used for Feeding Monitoring & Management

- Precision feeding
- Simple Indigestion
- Sub-acute rumen acidosis (SARA)
Unbalanced Feeding Ration

- Low Fat
- Fat Decrease
- Protein Decrease
- SARA Suspicion - Day
- SARA Suspicion - Session
Effect of Precision Feeding on Performance, Nutrient Excretion and Feeding Behavior of Early Lactation Dairy Cows

Conclusions: Allocating concentrates according to the needs of the cows improved lactation performance and efficiency of DM conversion compared with feeding a single TMR

Ephraim Maltz et al.
Using AfiLab Data to Detect Clinical Mastitis

Daily milk lactose concentrations (%) of case and controls

Day relative to clinical diagnosis (d0)

P<0.05

Tholen at al., 2012
Summary

Each herd has its own internal truth

• Preventing excessive body fat loss is key for optimal transitions to improved production and fertility performance
• Understanding physiological changes provides a basis for management strategies
• AfILab real time milk analyzer takes dairy herd management to the next level
• Its abundance of data and immediate availability opens new territories in dairy herd management, territories we are exploring vigorously and determinedly
Thank you!