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

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afimilk, Afikim, Israel

➢ **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**

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Holstein spotting kit.

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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**

Decades of Genetic Improvements and Selection...
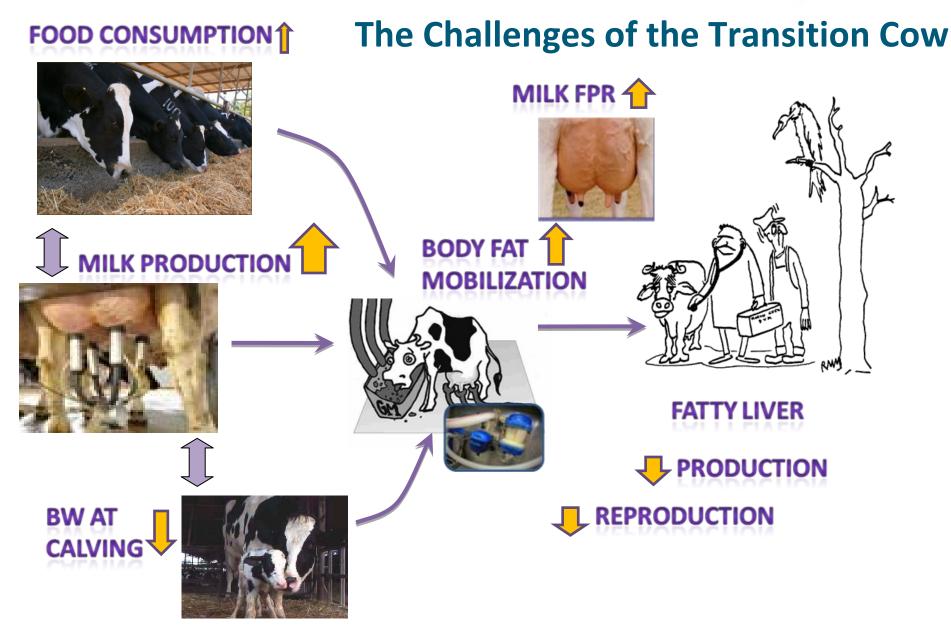
Milk production is the cow's top priority

Feed intake < Energy requirements

Negative energy balance (NEB)

"YOUR BLOOD PRESSURE IS SKY HIGH! NO MORE SALT LICK FOR YOU!"

The Challenges of the Transition Cow

FOOD CONSUMPTION ↑

MILK PRODUCTION ↑

BW AT CALVING ↓

MILK FPR ↑

BODY FAT MOBILIZATION ↑

FATTY LIVER
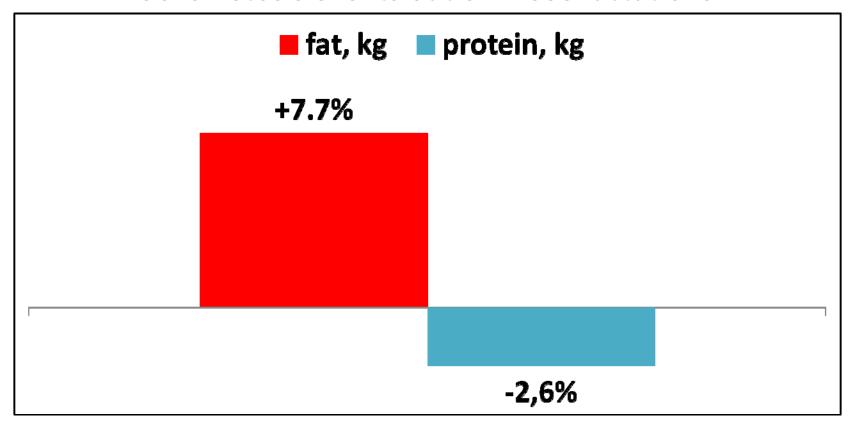
↓ PRODUCTION

↓ REPRODUCTION

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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

Ketosis & Milk Fat-to-Protein Ratio Relations

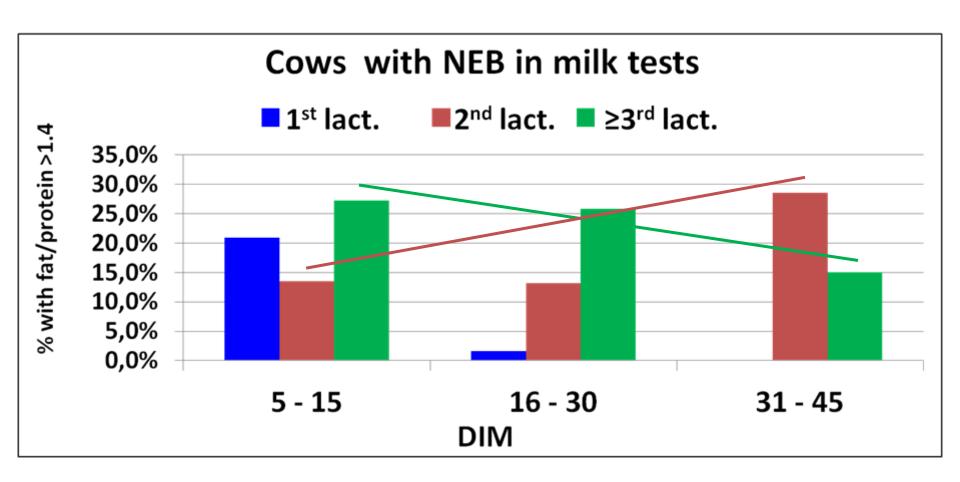## 180 days milk yield loss (kg) for various risk factors compared to cows with "no factor"

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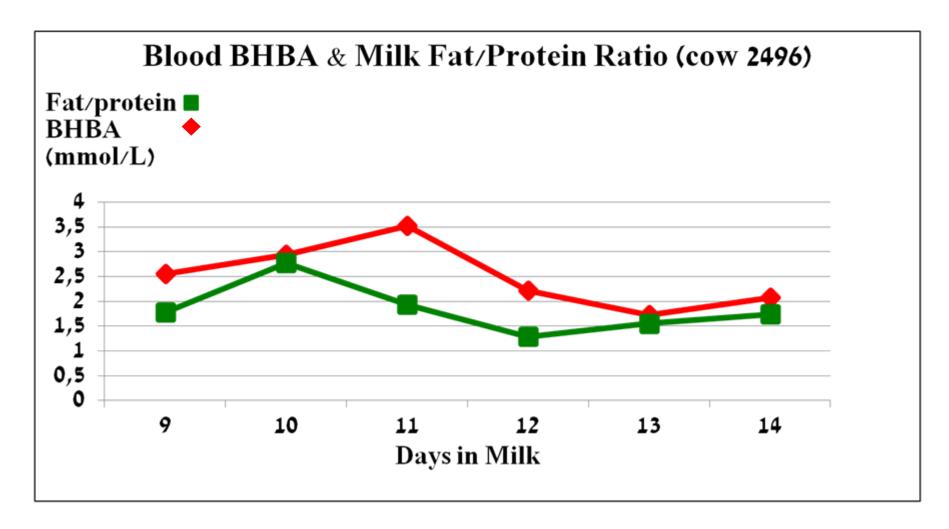

dystocia	FPR>1.4 (17%)	ketosis (13%)	uterine disease
-115	-148	-106	-160

From Nir – Markusfeld and Ezra , 2013

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Israeli Herd-Book data

Different Patterns of Herd Energy Status

Oded Nir–Markusfeld, 2011

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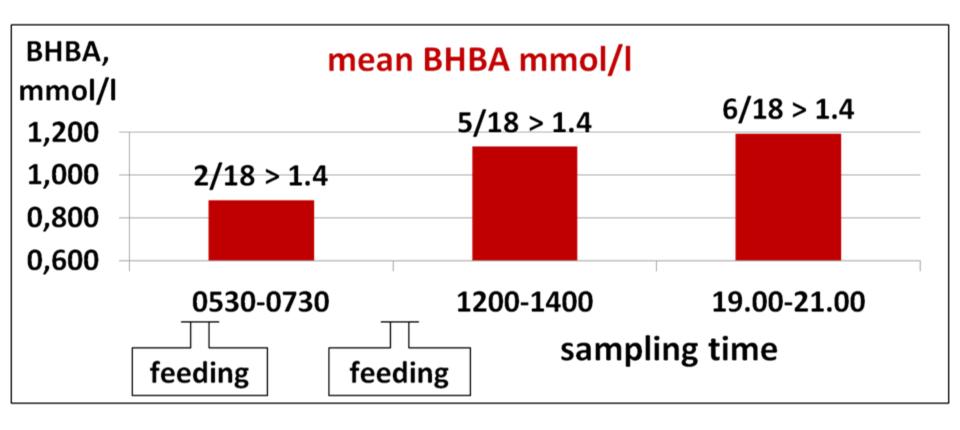
Time Differences Between BHBA and FPR

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

Schcolnik et al, 2007

Blood Ketone Changes During a Day

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**

Model	Fat/protein ratio	Sensitivity	Specificity
A	High	55%	85%
B	Low	85%	55%

Schcolnik et al, 2006-2012

Suspected Ketosis (AfiLab Configuration) (08/03/2011 08:58:43)

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Save   Save As...   Design   Refresh   ?

Index	Cow	Lact. no.	Grp.	DIM	Fat/Protein 1	2	3
1	6275	5	3	4	--	1.34	1.30
2	6374	4	3	16	1.60	1.85	1.56
3	6376	4	2	29	1.18	1.40	1.16
4	6397	4	3	37	--	1.69	1.44
5	6494	4	2	11	1.63	1.76	1.65
6	6585	3	3	40	1.12	1.40	1.23
7	6596	3	3	10	1.37	1.66	1.48
8	6616	3	3	16	--	1.40	1.22
9	6637	3	2	27	1.24	1.78	1.24
10	6655	2	1	21	1.07	1.44	1.26
11	6664	2	1	31	1.07	1.41	1.08
12	6704	2	1	18	1.49	1.75	1.62
13	6769	2	1	28	0.99	1.40	1.21
14	6776	2	1	4	1.35	1.21	1.13
15	6777	2	1	15	1.50	1.71	1.93
16	6916	1	4	9	--	1.38	1.48
17	6977	1	4	10	1.77	1.84	1.64
18	6984	1	4	5	1.31	1.08	1.36
Avg.	--	--	--	18	1.34	1.53	1.39

Using this combined model farmers get a daily list of cows (5-45 DIM) to treat for ketosis

Why should we worry about cow 919?

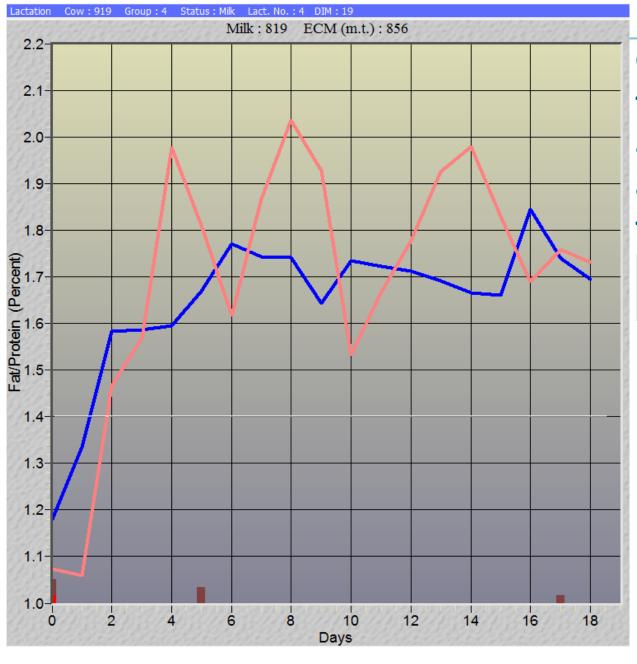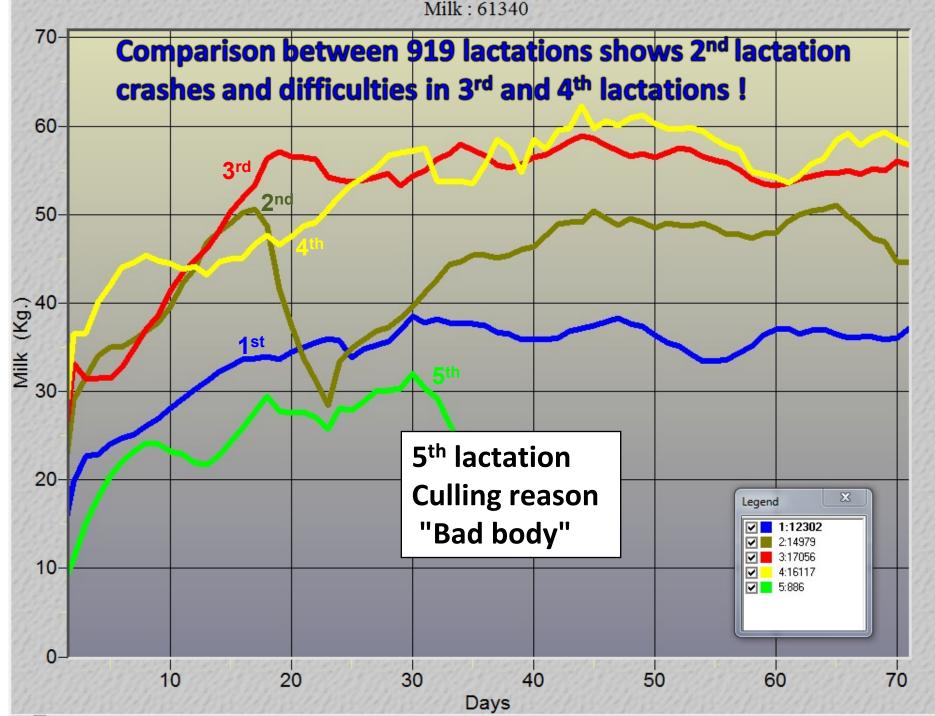**Cow 919 is suffering from ketosis according to AfiLab almost from calving time**

Milk

Fat/protein

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Milk : 61340

Comparison between 919 lactations shows 2nd lactation crashes and difficulties in 3rd and 4th lactations !

3rd
2nd
4th
1st
5th

5th lactation
Culling reason
"Bad body"

Milk (Kg.)
Days

Legend
☑ 1:12302
☑ 2:14979
☑ 3:17056
☑ 4:16117
☑ 5:886

Daily Milk Composition Used for Feeding Monitoring & Management

- ✓ **Precision feeding**
- ✓ **Simple Indigestion**
- ✓ **Sub-acute rumen acidosis (SARA)**

Feeding Control 23/02/2013 (24/02/2013 10:25:19)

Station tree   Recommendations   Recalculate   Parameters

Unbalanced Feeding Ration

Low Fat 🔴

Fat Decrease 🟢

Protein Decrease 🟢

SARA Suspicion - Day 🔴

SARA Suspicion - Session 🔴
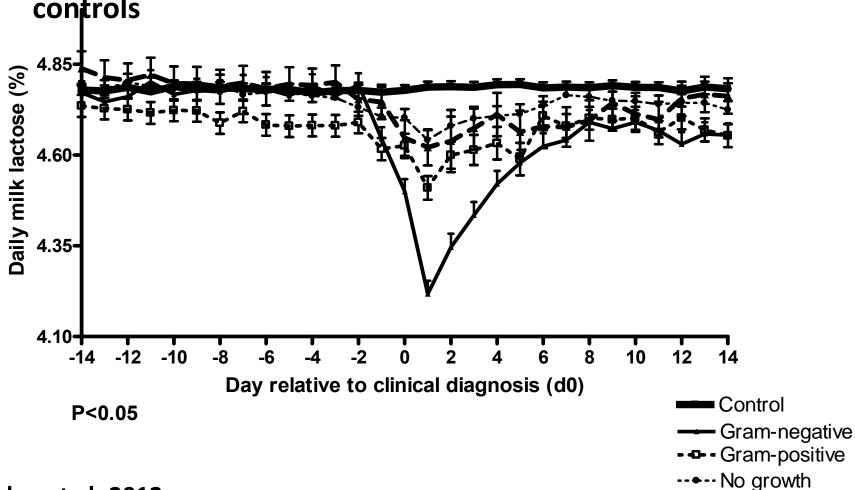
Using AfiLab Data to Detect Clinical Mastitis

Daily milk lactose concentrations (%) of case and controls

P<0.05

Tholen at al.,2012

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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!

For more ore information cont contact us:
www.afimilk.com om

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Vital know-how in every drop

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