The unfolding of new analytical concepts
managing expectations, challenges and disappointments

Dr. Christian Baumgartner
Your late husband was a very successful hunter?

...oh, no, a very unsuccessful vet...
Since the late 19th century DHI („Milchkontrolle“) is the backbone of dairy farming! And analytics always have been a part of it (fat/Gerber).
You only can operate what you can measure!

- cybernetics

Norbert Wiener (1948):
“Cybernetics or Control and Communication in the Animal and the Machine”

Today we understand a dairy herd as a multitude of regulatory circuits (cows) and itself as one!

- Current challenges
How „Milchkontrolle“ developed...

...and adjusted to the respective contemporary challenges:
until 1970ies ➔ „value“ of a cow?
   ➔ kg, fat, protein [lactose] (independently recorded)
1980ies ➔ udder health? ➔ SCC (health management)
1990ies ➔ metabolism? ➔ urea (feeding management)
1990ies ➔ milkability? ➔ Lactocorder (herd management)
2000s ➔ ???
Recent challenges

Drivers for new analytical concepts

- computer technology - communication technology - automation - miniaturization
- globalization - on-farm concepts - growing herds - growing productivity

⇒ sensor systems and IT solutions to support herd management
⇒ how digging information out of a vast mass of data?

- new options with new techniques and advances in analytics ⇒ FTIR, ELISAs, ...
- new socio-economic demands and challenges ⇒ volatile markets / prices
⇒ sustainability ⇒ animal welfare ⇒ animal well-being ⇒ impact of dairying on humans (AMR, environment, ...)

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How to meet the challenges?

Use the USP of DHI!
(unique selling proposition)
Extract as much
information as possible
from a milk sample!

2000s
serological analyses
BHV1, Leukose, Brucellose
FTIR
Casein, fatty acids,
BHB, Aceton
pH-value, freezing point
[PCR etc.] ➔ sample quality

2010s

How are „our cows“
doing?
well-being
metabolism
udder health
Pregnancy
...

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How to translate into analytical concepts?

Example: differentiation of immune cells of the udder ➔ DSCC

• Knowing from science / theory ➔ DSCC can...
  - ...specify the phase of an inflammation process (acute - chronic)
  - ...be of prognostic value (cure - no cure, e.g. when treated with antibiotics)

• DSCC requires ➔ specific sampling (quarter milk, glass tubes, no preservation, short ways, cooling, specific analytical tools and knowledge, ...)

• „DSCC in DHI? Simply not possible!“

➔ trade-off: feasible? gain of information vs. costs?
➔ decision making: market + plan + budget + supporters ➔ start
German Udder Health Program

3.7 million cows under DHI

2012 – 2016
Prof. Dr. Volker KRÖMKER

milchQ plus
2012 – 2016
Prof. Dr. Volker KRÖMKER

2016 – 2019
Univ.-Prof. Dr. Marcus G. Doherr
German Udder Health Program

- New key figures - based on SCC
- DSCC as a new diagnostic tool ➔ check the suitability of a new method under prevailing conditions in Bavaria/Germany (transport, preservation...) ➔ change of preservative for DHI samples in Bavaria in 2015
- Communication !!!

milchQplus
2012 - 2016

- Follow-up project for DSCC
- Diagnostic tools for practical use
- Communication !!!

ZellDiX
2016 - 2019
Still we only have a concept!

**Expectations**
- DSCC in the DHI report as soon as possible
- Tools for herd managers to better screen and decide
- Data about (progress in) udder health

**Challenges**
- Technical implementation
- Data to proof practical value
- Change DHI routine (sampling, frequency)
- Practical implementation

**Dissappointments**
- Time / progress
- Investment needed
- Hardware, Software
- Change of routines, Working hours
- Unexpected pitfalls
- Competition
Innovation in analytics ≠ „plug and play“

Expectations

Dissappointments
Thank you!