New on-farm technologies in dairy herd improvement (DHI) and farm management

ICAR 2012, May 28

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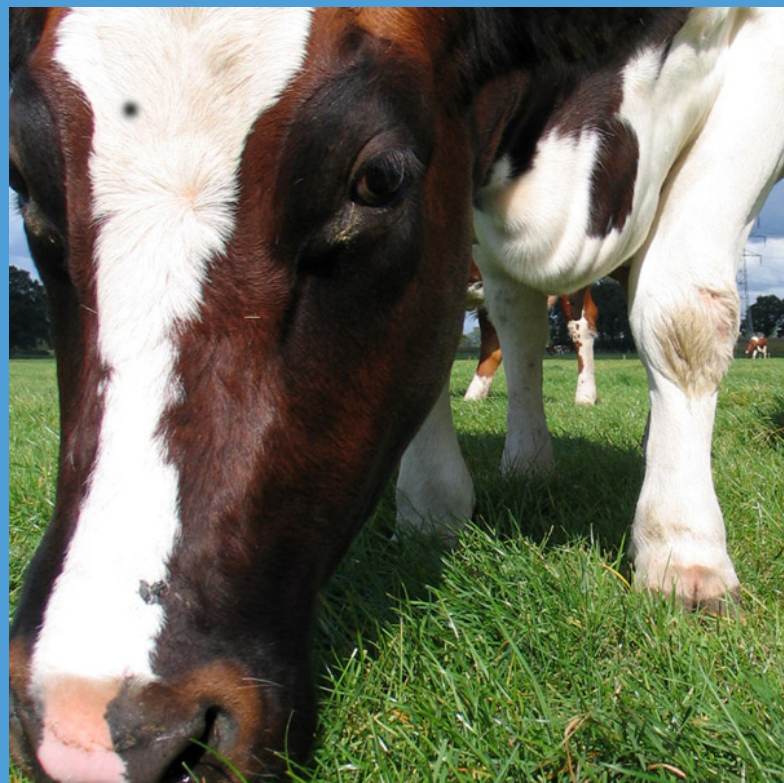
* ICAR Test Centre - NL

New on-farm technologies & milk recording

- Developments in farming
- Use of technology on dairy farms
- Milk Recording and ICAR
- ICAR Guide Lines



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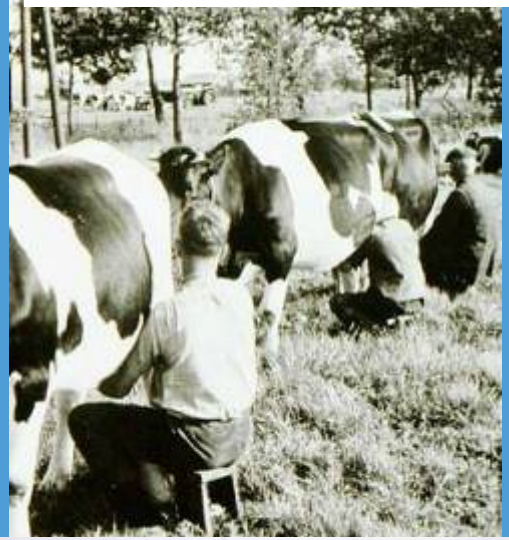
Developments in machine milking



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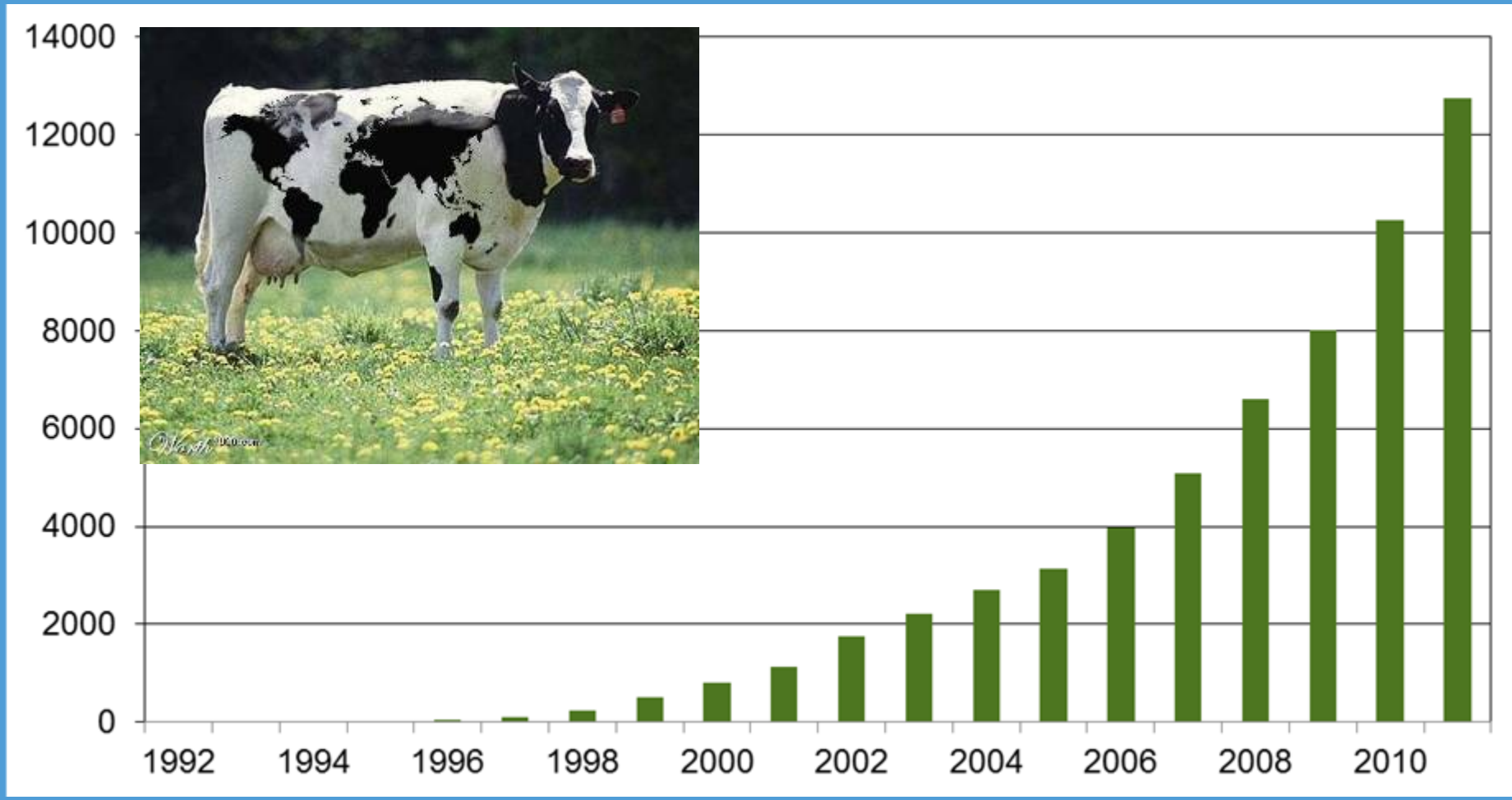
Milking parlour or AMS ?

Every 5 out of 10 NL farmers choose AMS

AMS farms world wide



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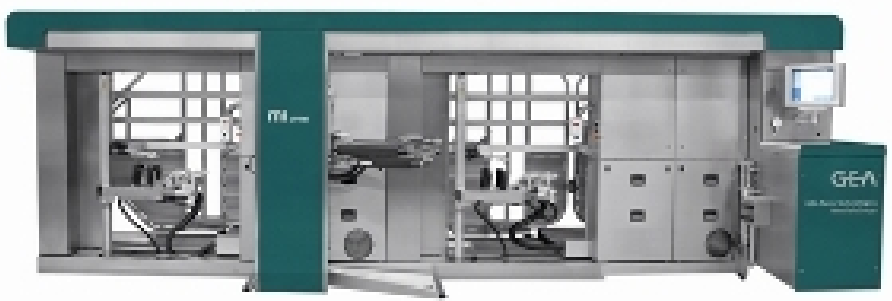
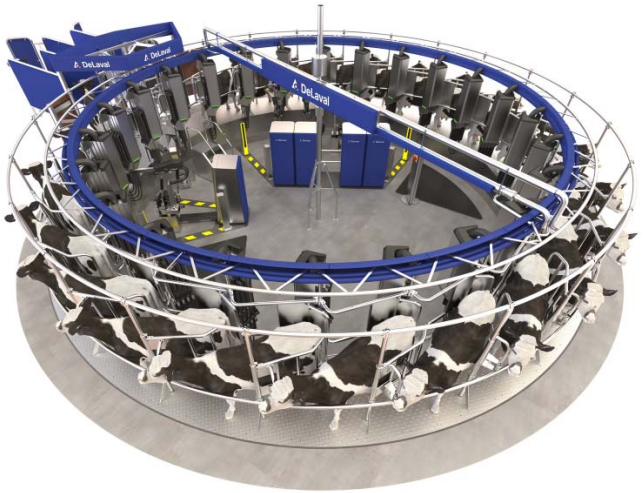
Manufacturers

Manufacturers





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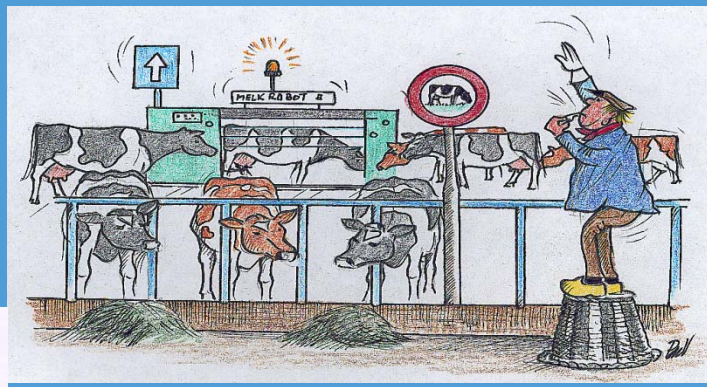
Management Aspects AMS

- Increase in milk yield limited, however large variations among farms
- More and more statistical tools (data mining)
- Individual response of animals
- Optimizing individual milking criteria and feed input
- Sensor technology
  - Hugh amount of data
  - Management by exception



New Technologies and Milk Recording

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- Take Home Message

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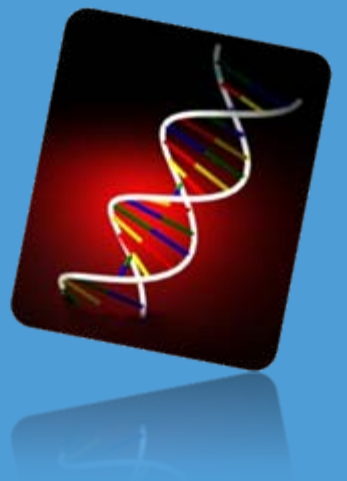
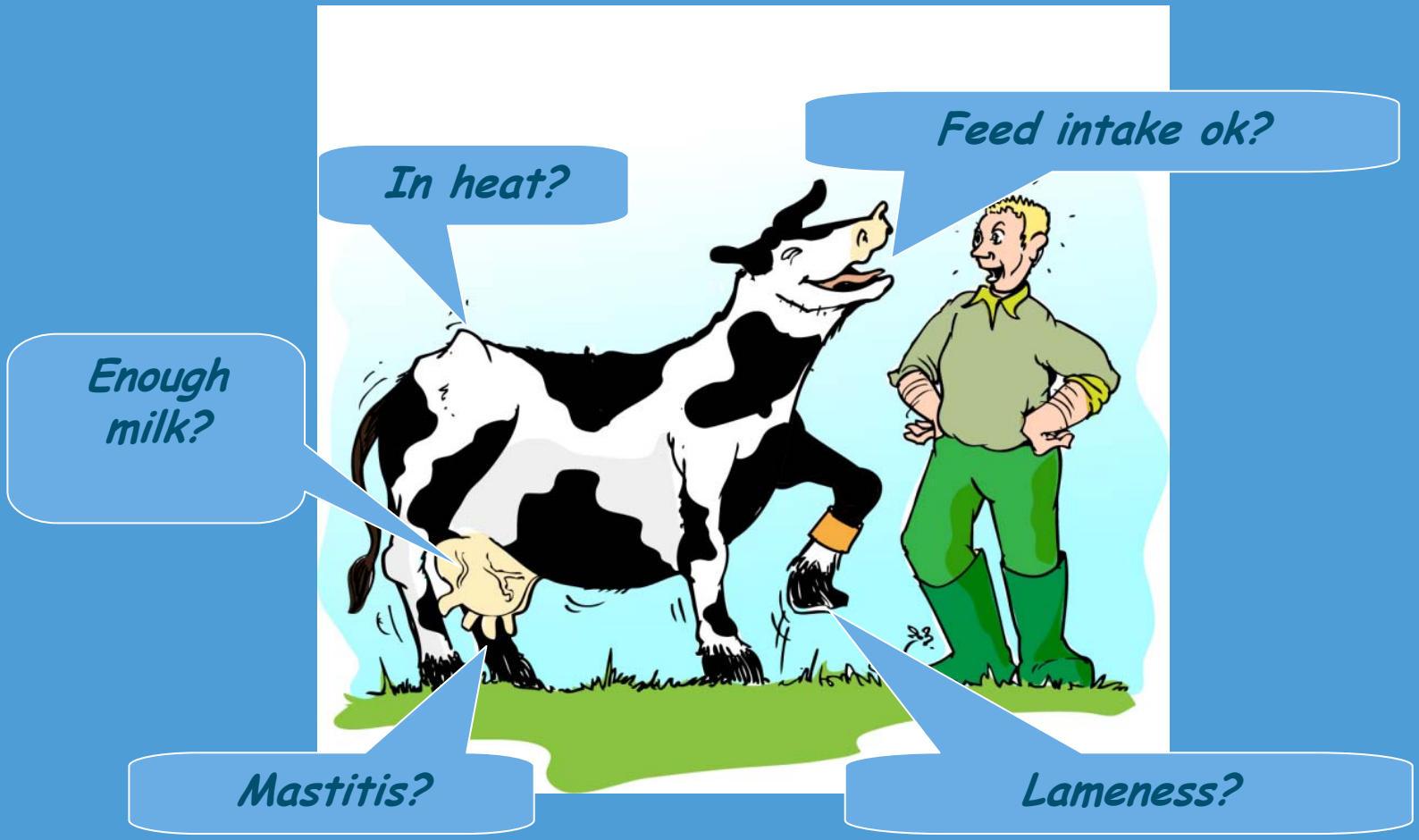
Current technologies on dairy farms

- Utilization of electronic devices and systems
  - ID, concentrate feeders
  - yield sensors, pedometers, conductivity
- Automatic Milking Systems growing fast
- More and more integrated systems on farm
  - (ID, Yield, Data collection, sampling)
- Development of Genomics
- Strong growth of external data services
- In-line sensors and on-farm analyzers are entering market



Smart farming? Individual approach in large herd…



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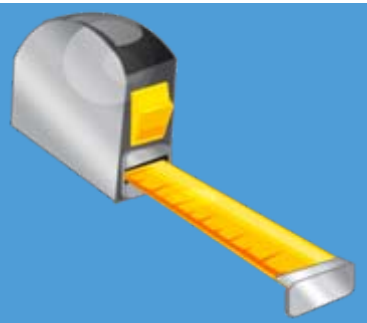
Sensors in dairy production

Measurements	Indications	Management
Hormones	Heat	Reproduction
Urea	Ketosis	Feeding
Proteins	Inflammation	Health
Pathogens	Mastitis/diseases	Health / Product
Conductivity	Mastitis	Health
Residues	Milk quality	Product quality
Yield,fat and protein	Feed quality	Feeding
Body score	Condition	Feeding
Locomotion score	Claw health	Health
Location (gps)	Diseases, welfare	Health

Information is the key element

FROM MEASUREMENT TO KNOWLEDGE



Information on:

- Herd management
  - Milk recording, data services
  - Feeding management
  - Health management

- Farm, technical and financial management
- Support for governance, administration but also certification systems (quality assurance -chain)
- Sustainability programs dairy industry

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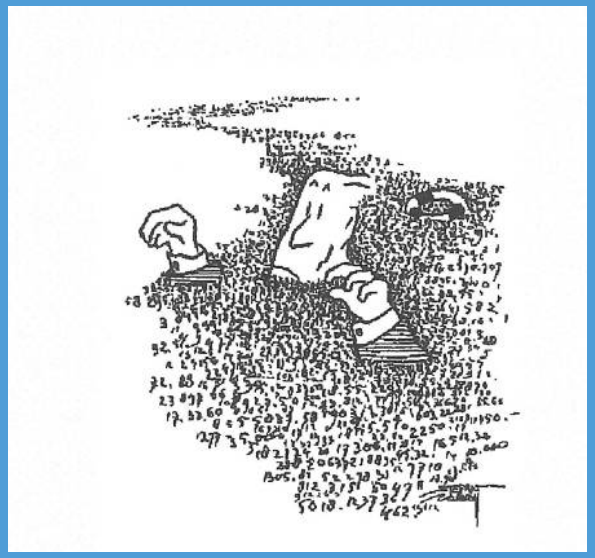
“We are drowning in data but starving for information” John Naisbett



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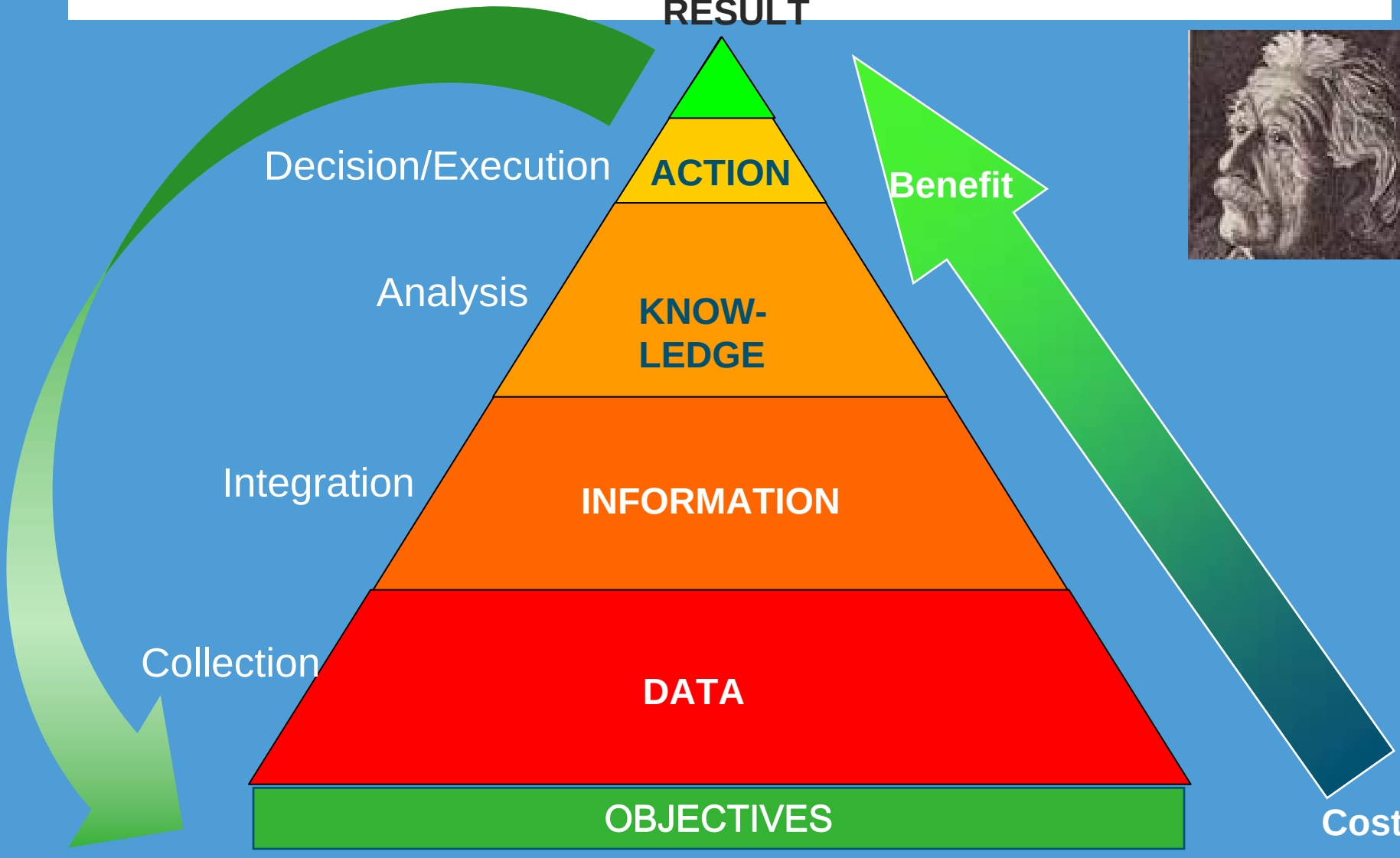
From Data to Result



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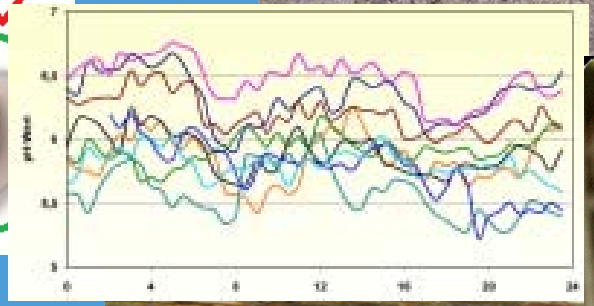
Sensor technologies



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Milk meters & samplers (see www.icar.org)












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External analysis

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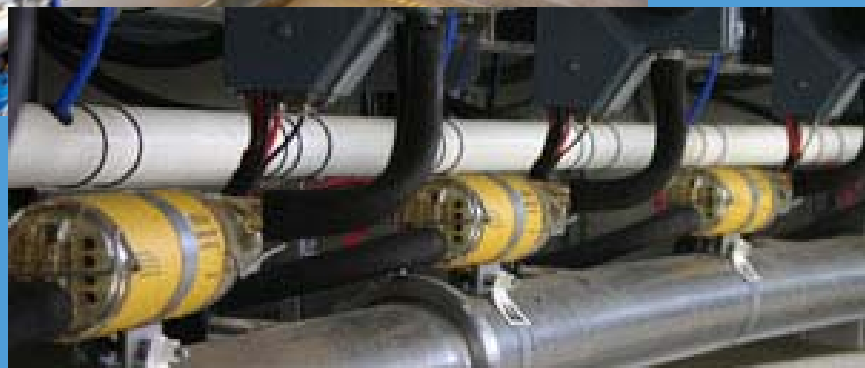
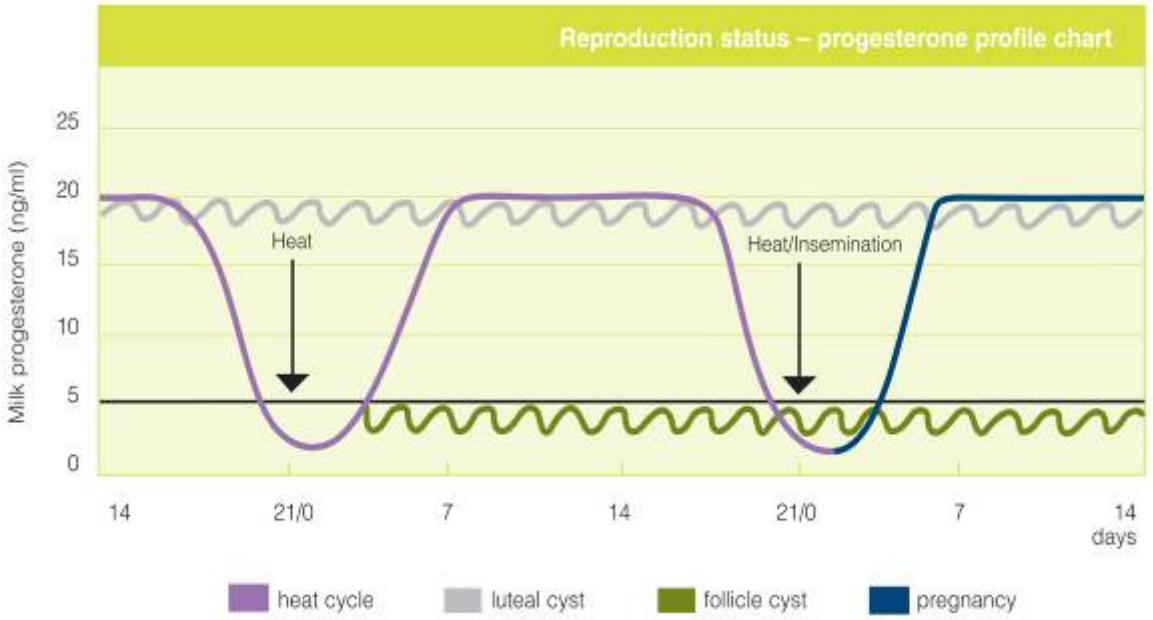
Milk components on-farm

Milk components in-line

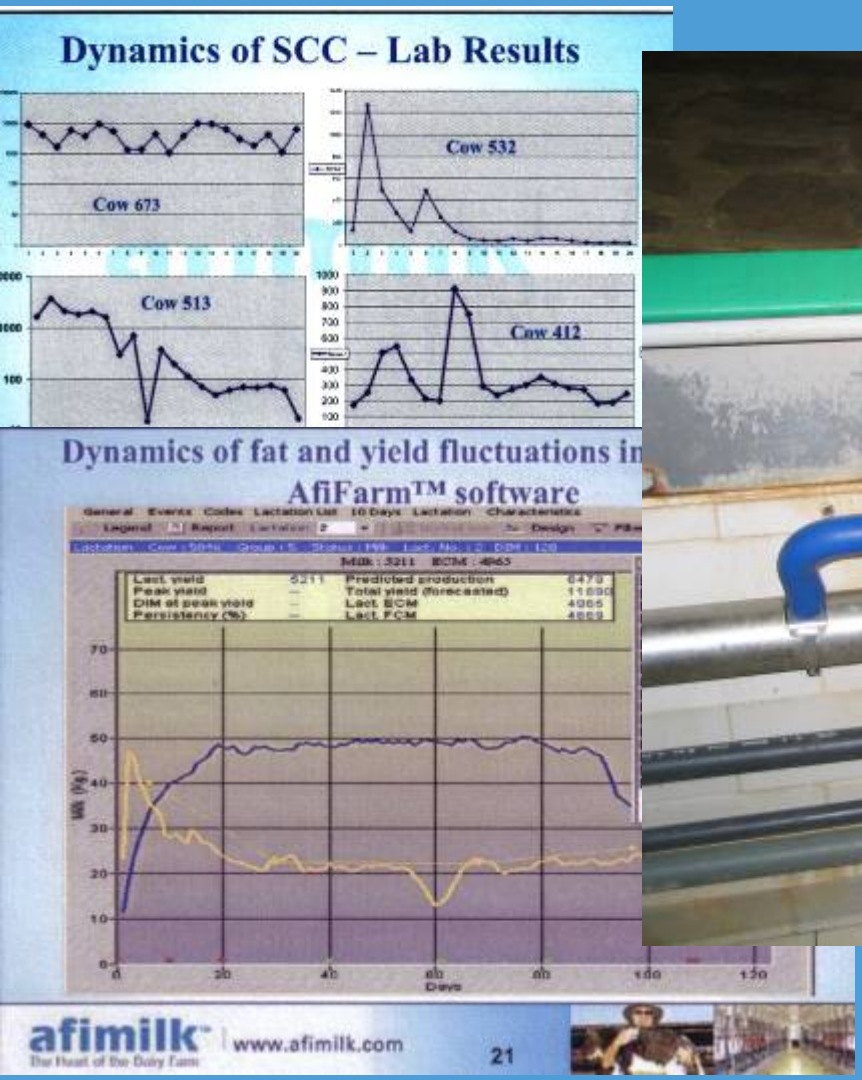


Herd Navigator: Progesteron, LDH, BHB

Focus area	Parameter analysed in milk	Early / on time detection
Reproduction	Progesterone	Heat Silent heat Pregnancy Abortion Cysts Anoestrus
Udder health	LDH – lactate dehydrogenase	Mastitis Subclinical mastitis
Feeding and energy balance	Urea BHB – beta hydroxybutyrate	Feed ration – protein Ketosis Subclinical ketosis Secondary metabolic disorders



Afilab: Milk composition in-line



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Animal production future challenges

- Need:
  - Improvement of production and product quality
  - Lowering cost price
- Tools:
  - Early warning systems for management and quality programs
  - Sensors & Internet applications
- Possibilities:
  - Measurements at animal level
  - Day to day management & genetic data
- Key success factors
  - Robust and profitable systems, fitting in the management of the farmer

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Modern milk recording herds

- Cow ID, electronic milk meters, samplers, computer systems, Internet Access
- Need for information on SCC, urea, fat, protein, lactose, progesteron,
- Day to day management
- External analysis samples in well organized laboratories
- In-line and on-farm sensor developments
    - Threat or Opportunity?
- Time gain, quality of data versus costs
- New services

Milk Recording

- Genetic improvement
- Benefits not only from genetic improvement, also
  - Feeding
  - Daily herd management
  - Disease control
- ICAR current focus on device accuracy levels
  - Approval procedures,
  - Device requirements
  - Routine test procedures

Milk Recording Future

- More towards integrated systems
  - New devices like in-line meters,
  - Test procedures,
  - Continuous monitoring
  - Quality Assurance
- Generic sampling systems for on-farm use
- Samples for disease control, DNA testing
- Issues like carry-over more important
- Sub Committee Recording Devices has several AT
  - Continuous monitoring, generic samplers
  - Carry over

ICAR Guide Lines milk analysers

- Laboratory equipment
  - Milk analyzers
- On-farm (at-line) analyzers
  - Milk analyzer on farm using a representative sample
- In-line analyzers
  - Mounted in the milking system
  - Real-time or at the end of milking on a representative sample of the whole milking
- Chapter 11 adapted for in-line analyzers
  - First system under test

Alternative routine testing methods

- Calibration, Routine testing and Maintenance
- Manual water tests very time consuming
- Use of smart statistical methods
- Use of milk meter data (milk meter, yield, cow number)
- Difference average per cluster number vs average all milkings on all clusters
- Several methods are possible
- Action team within Sub Committee Recording Devices
    - Clement Allain – session T4 – May 30.

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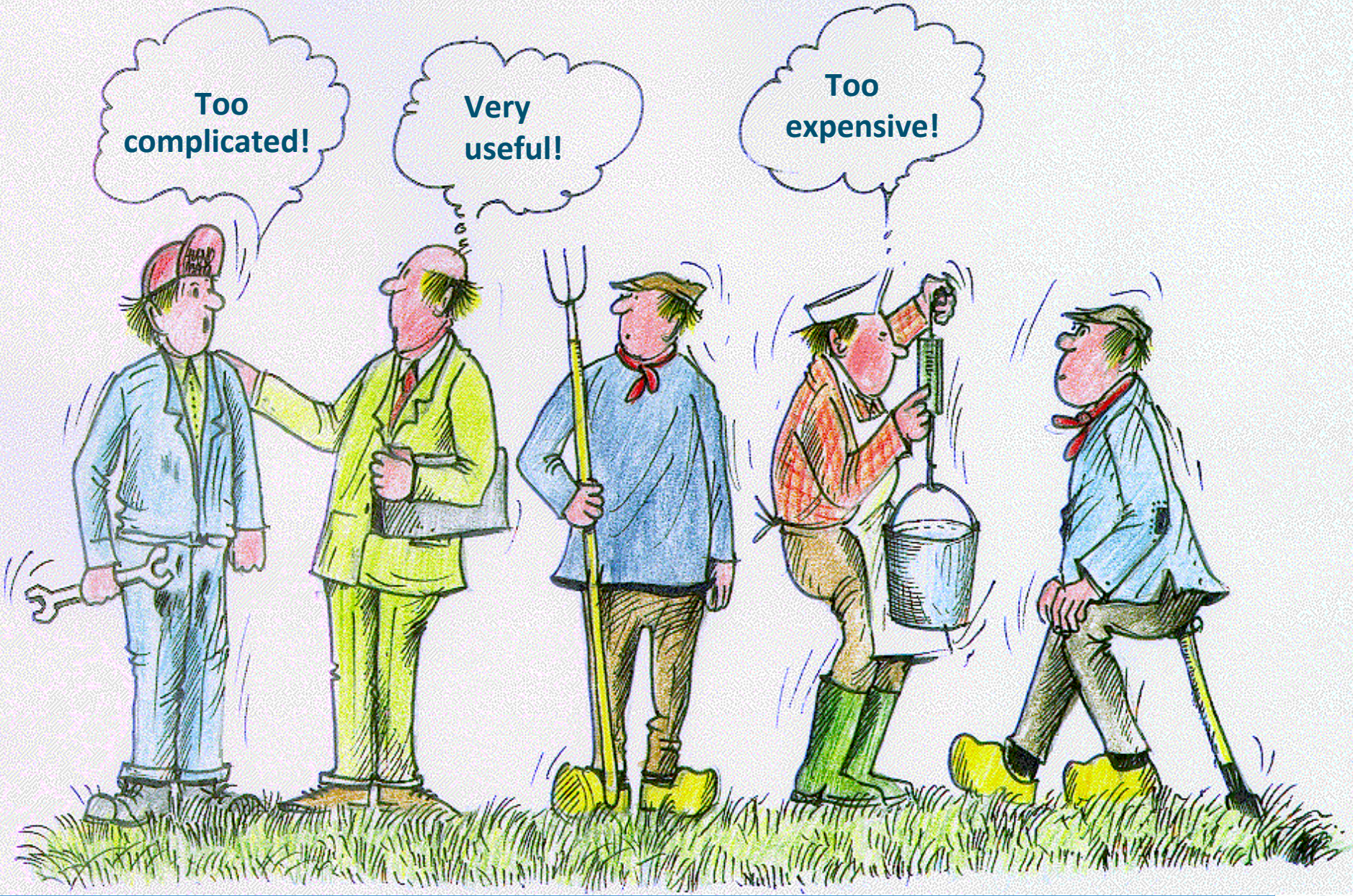
Precision farming, the right answer !?

- Technology to save labour and costs
- Technology to improve
  - Management
  - Milking including milk recording
  - Feeding
  - Social life
- Past many technologies, few were really successful, we have to learn from the past
- Farmers will adapt new technologies, however..


Too complicated!
Very useful!
Too expensive!

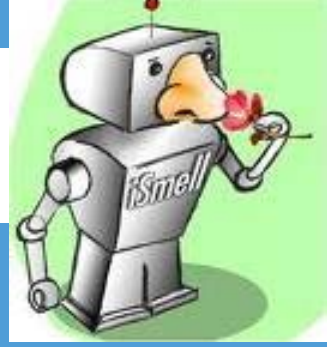
Future milk recording: combining precision farming technologies and external services

Smart combination of tools, technologies and skills

- Measurement, interpretation, action of the farmer
- Integrated approach necessary

- Challenge is to analyse, to interprete data and to transfer into actions
- Helpful means to improve farming business
- New management services
- Industrial partners play important role
- Co-innovation is key for success

What else to expect in future?



- Ongoing technology development
  - Labour, animal care, dairy chain related
- New sensors
  - Food safety, composition,
  - Health and welfare status, antibiotic therapy,
  - Genomics, GHG
  - Basis milk, odeur, movement, blood
- On farm processing of milk components
- Measure locally, (data) analysis externally
- Data will be used within the Food Supply Chain
- Chances & opportunities

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