vit IT-Solutions for Animal Production

Controversies & Consensus in Bovine, 27-30 August 2015, Berlin / Germany

Challenges of implementing new traits in dairy breeding: The role of communication from a breeder's point of view

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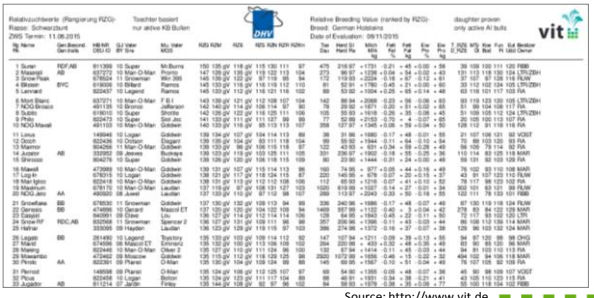
Overview

- trait spectrum in dairy breeding: supply and demand
- developments in dairy breeding
- new traits in dairy breeding
  - general challenges and strategies of phenotyping
  - specific issues regarding direct health traits
- new traits and the new role of communication

Trait spectrum in dairy breeding: supply

- large numbers of traits in routine recording and evaluation systems for dairy cattle
- milk recording and evaluations of breeding organizations giving access to dairy performance data in the wider sense
  - production (milk, fat, protein yields)
  - functionality
    - conformation
    - udder health
    - longevity
    - calving
    - female fertility
    - workability



Source: http://www.vit.de

Trait spectrum in dairy breeding: supply

⇒ http://www.interbull.org assessed 25 Aug 2015

Country	Production (N=3)	Conformation (N=19-20)	Udder health (N=2)	Longevity (N=1)	Calving (N=4)	Female fertility (N=5)	Workability (N=2)
Argentina	x						
Australia	x	x	x	x	x	x	x
Belgium	x	x	x	x	x	x	
Canada	x	x	x	x	x	x	x
Croatia	x		x				
Czech Republic	x	x	x	x		x	
Denmark, Sweden, Finland	x	x	x	x	x	x	x
Estonia	x	x	x				
France	x	x	x	x	x	x	x
Germany, Austria, Luxembourg	x	x	x	x	x	x	x
Great Britain	x	x	x	x	x	x	x
Hungary	x	x	x	x	x		
Ireland	x	x	x	x	x	x	
Israel	x		x	x	x	x	
Italy	x	x	x	x	x	x	x
Japan	x	x	x				
Latvia	x		x				
Lithuania	x		x				
The Netherlands (incl. Belg. Flem.)	x	x	x	x	x	x	x
New Zealand	x	x	x	x	x	x	x
Norway	x	x	x		x	x	x
Poland	x	x	x	x		x	
Portugal	x	x	x				
Rep. of Korea	x	x	x				
Rep. of South Africa	x	x	x	x		x	
Slovenia	x	x	x	x			x
Slovak Republic	x		x				
Spain	x	x	x	x		x	
Switzerland	x	x	x	x	x	x	x
United States	x	x	x	x	x	x	
Uruguay	x						
TOTAL	**31**	**24**	**29**	**20**	**16**	**19**	**12**

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Argentina	x						
Australia		x	x	x	x		x
Belgium		x	x	x	x		
Canada		x	x	x	x		
Croatia							
Czech Republic	x			x			
Denmark, Sweden, Finland	x						x
Estonia	x						
France	x						x
Germany, Austria, Luxembourg	x						x
Great Britain	x	x	x				x
Hungary	x	x	x	x	x		
Ireland	x	x	x	x	x	x	
Israel	x		x	x	x	x	
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Poland	x	x	x	x		x	
Portugal	x	x	x				
Rep. of Korea	x	x	x				
Rep. of South Africa	x	x	x	x		x	
Slovenia	x	x	x	x			x
Slovak Republic	x		x				
Spain	x	x	x	x		x	
Switzerland	x	x	x	x	x	x	x
United States	x	x	x	x	x	x	
Uruguay	x						
TOTAL	**31**	**24**	**29**	**20**	**16**	**19**	**12**

weak genetic correlations to direct health traits

moderate genetic correlation between somatic cell count and mastitis

very global measure ('mixture trait' including relevant health aspects)

global measure ('mixture trait' including relevant health aspects)

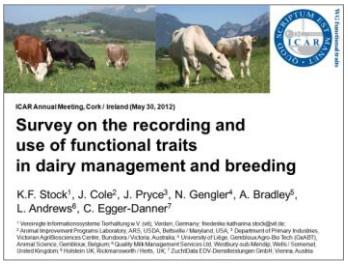
Trait spectrum in dairy breeding: demand

- more targeted approaches to improve functionality
  - shift from indirect measures (indicator traits) to direct measures
  - refined trait definitions (→ improved recording)
  - new traits (→ additional recording)
- global rather than focal strategies and actions
  - stakeholder groups:
    dairy sector (farmers, breeding organizations, service providers), politics and society, consumers
  - key factors:
    sustainability, profitability (economically sound), efficiency, responsibility, informed decisions, animal health and welfare

Developments in dairy breeding

- substantial genetic progress in <u>production traits</u> of dairy cattle
  - routine performance testing (quantity and quality of phenotype data)
    e.g. Germany: high coverage of milk recording, with monthly testing of 86% of dairy cows
  - conventional and genomic breeding programs
- increasing importance of <u>functional traits</u>
  - integral parts of dairy breeding programs
  - increasing weights in selection indices
    ⇔ relevance of **sustainability** aspects ↑
  - in the focus of R&D activities worldwide:
    health (direct health traits)
    >> **longevity / survival** > efficiency

(HIGHLY) DYNAMIC PROCESS OF IMPROVING THE BREEDING PROGRAMS FOR DAIRY CATTLE

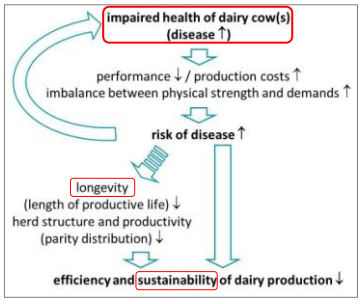

ICAR Annual Meeting, Cork / Ireland (May 30, 2012)

Survey on the recording and use of functional traits in dairy management and breeding

K.F. Stock[1], J. Cole[2], J. Pryce[3], N. Gengler[4], A. Bradley[5], L. Andrews[6], C. Egger-Danner[7]

Sustainability & health

- new goal-setting with shift
  from short-term and individual
  to long-term and global benefits
- <u>challenges of target definition</u>
  - identification of suitable indicators
    complex interplay of multiple factors on various levels
  - reliable and sufficiently broad information basis
    data sources (documentation routines or automated measurement vs. new recording),
    data accessibility (increase of on-farm data collection ≠ data transfer for routine analyses)



- approaches
  - global measure → **longevity**
  - major determinants → **health**

PRO easy to measure, established population-wide data collection (data quantity)
CON heterogeneous causes / influences

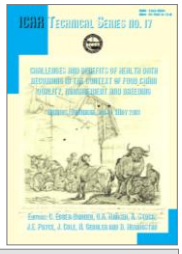
PRO specificity (data quality)
CON difficult and expensive to measure, often insufficient population-coverage

HEALTH in the focus (I)

- international trend in dairy breeding: replacing indirect by **direct selection for improved health**

✓ ■ framework across countries

- <u>increased legal requirements</u>
  regarding animal health issues
  heterogeneity of regulations ↓, pressure on livestock sector ↑
- <u>increased awareness</u> of the need
  for targeted health improvement
  new phenotypes in the context of methodological progress
  ('better' traits, specific rather than global trait definitions)



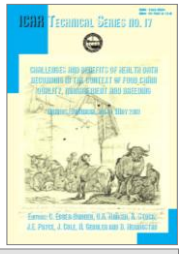
HEALTH in the focus (II)

- international trend in dairy breeding: replacing indirect by **direct selection for improved health**

✓ ■ framework across countries

✓ ■ <u>motivations</u> for using health traits in breeding

- societal demands:
  responsible modern livestock production
  (animal health and welfare; public reputation of agriculture, politics)
- dairy sector demands:
  optimized production conditions
  (productivity, production efficiency, profitability; economics)
- consumer demands:
  transparency and reliability
  (food safety, product quality, informed decisions)



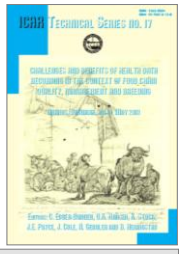
HEALTH in the focus (III)

- international trend in dairy breeding: replacing indirect by **direct selection for improved health**

✓ framework across countries

✓ <u>motivations</u> for using health traits in breeding

X <u>challenges</u> related to working with health data
  - legislation, information / transparency, data sensitivity, data security
  - data recording and logistics
  - data quality, validation, data processing and analysis, interpretation



Health & communication

- <u>external</u> and internal challenges
  - different stakeholder groups = different knowledge, opinions, expectations
  - modern society requesting information → communication avoiding misinformation

COMMUNICATION:
- **is a CHALLENGE in itself**
- **is URGENTLY REQUIRED**
- **should be PROACTIVE rather than reactive**

<u>challenges</u> related to working with health data
- **legislation, information / transparency, data sensitivity, data security**
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Health & communication

- external and internal challenges
  - different stakeholder groups
    = different knowledge, opinions, expectations
  - modern society requesting information
    → communication avoiding misinformation
  - food safety, origin, production conditions as permanent hot topics,
    plus increased attention paid to animal health and welfare aspects
    → emotional rather than matter-of-fact debates,
    need for new communication strategies around animal production
    (breeding, management, handling from birth to death)

COMMUNICATION:
- **is a CHALLENGE in itself**
- **is URGENTLY REQUIRED**
- **should be PROACTIVE rather than reactive**
- **requires intense and honest involvement (AUTHENTICITY)**

challenges related to working with health data
- **legislation, information / transparency, data sensitivity, data security**
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- data quality, validation, data processing and analysis, interpretation

Health & communication

- external and internal challenges
  - valuation of increased effort with
    (extended) manual recording of health events
    monitoring as crucial step for improvements
    (data-based action instead of forced reaction);
    identification of good indicators (possibly easier to record),
    validation of indicator-based predictions
  - respect for concerns and practical limitations
    sensitivity of data, economic constraints

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Health & communication

- external and <u>internal</u> challenges
  - valuation of increased effort with (extended) manual recording of health events
    monitoring as crucial step for improvements (data-based action instead of forced reaction); identification of good indicators (possibly easier to record), validation of indicator-based predictions
  - respect for concerns and practical limitations
    sensitivity of data, economic constraints
  - delivery of valuable output
    comprehensive system with optimized reporting services, generating visible benefit (support of daily work of farm, long-term perspective as bonus)

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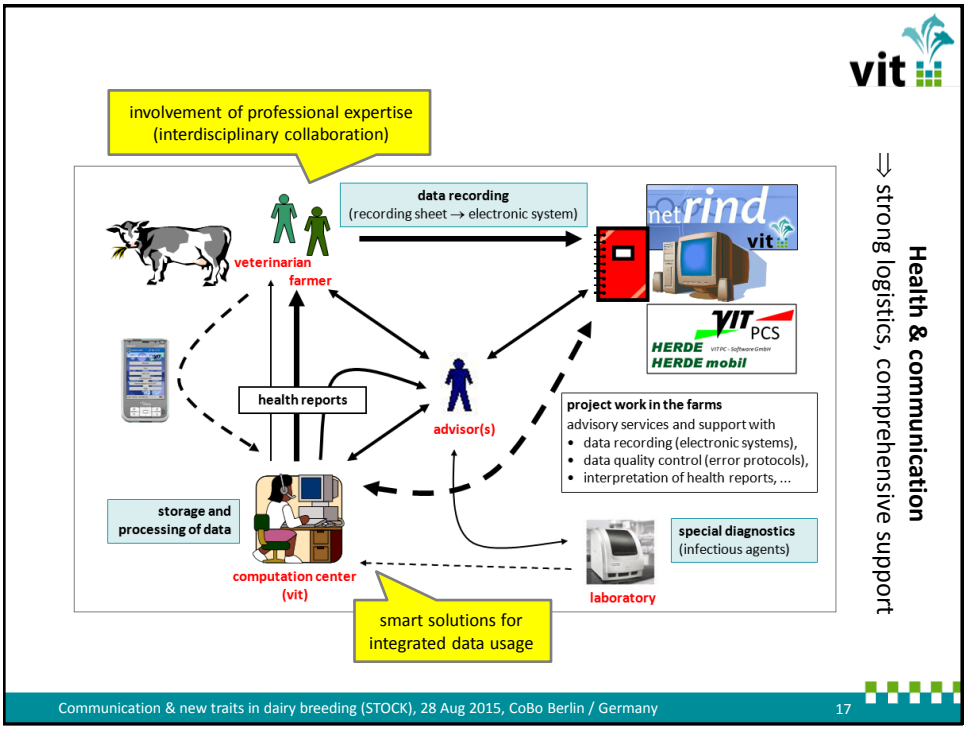
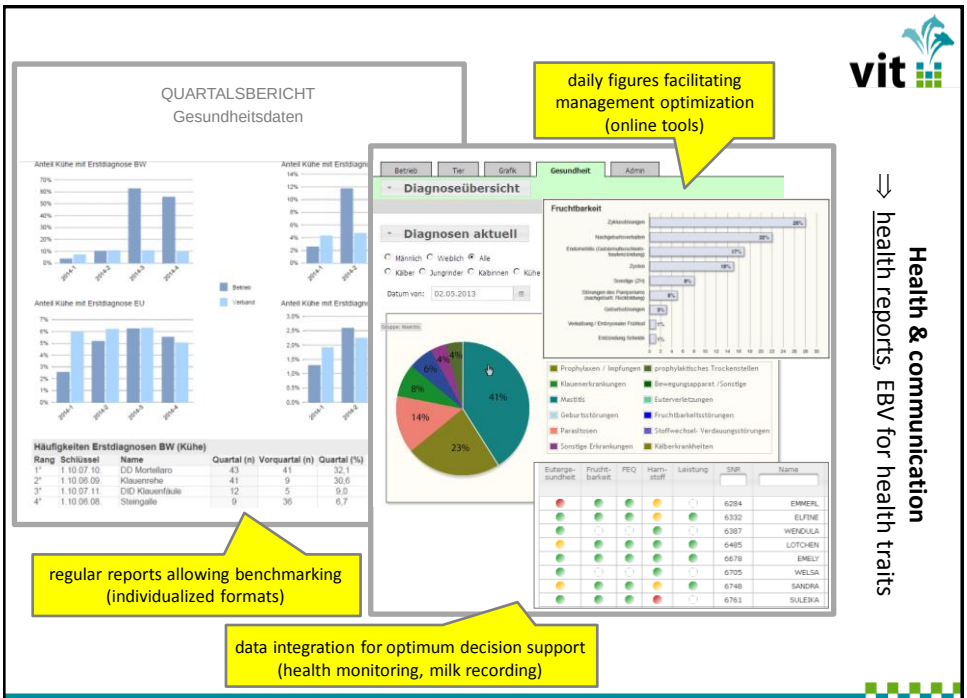
- **is URGENTLY REQUIRED**
- **should be PROACTIVE rather than reactive**
- **requires intense and honest involvement (AUTHENTICITY)**
- **must be CLEAR and TAILORED to the need of the practice**
- **is crucial for MOTIVATION → SYSTEM PERFORMANCE and SUCCESS**

<u>challenges</u> related to working with health data
- legislation, information / transparency, data sensitivity, data security
- **data recording and logistics**
- **data quality, validation, data processing and analysis, interpretation**

Health & communication

⇒ flexible solutions for health data recording


involvement of professional expertise
(interdisciplinary collaboration)
data recording
(recording sheet → electronic system)
veterinarian
farmer
health reports
advisor(s)
project work in the farms
advisory services and support with
• data recording (electronic systems),
• data quality control (error protocols),
• interpretation of health reports, ...
storage and
processing of data
computation center
(vit)
special diagnostics
(infectious agents)
laboratory
smart solutions for
integrated data usage
HERDE
HERDE mobil
Health & communication
⇒ strong logistics, comprehensive support


QUARTALSBERICHT
Gesundheitsdaten
daily figures facilitating
management optimization
(online tools)
Diagnoseübersicht
Diagnosen aktuell
Fruchtbarkeit
regular reports allowing benchmarking
(individualized formats)
data integration for optimum decision support
(health monitoring, milk recording)
Health & communication
⇒ health reports, EBV for health traits

⇒ health reports, EBV for health traits

Health & communication

New traits & the role of communication

- bridging the gap between relevant stakeholder groups with divergent background
  - dairy sector and non-agricultural people
  - science and practice

  ⇒ societal acceptance of modern dairy farming, implementation of up-to-date best practice

PERSONAL EXPERIENCE / OPINION

- information transfer
  - appropriate for the specific target group: understandable, relevant and clear key message
  - honest and differentiated enough: no sugarcoating, no over-simplification
  - proper timing: offensive rather than defensive actions
- transparency for preservation / re-gaining of trust

New traits & no communication?

- 'Don't touch delicate issues!' (no / minimum communication) as alternative strategy???
- external
  - only short-term (possibly) easier!
  - high risk of worsening the framework of dairy farming
    (lacking practice-input, unrealistic assumptions and expectations)
  - reaction-only (information on demand, forced answers) unnecessarily provoking mistrust
- internal
  - possibly some idea of trait prospects
    (project-related pressure / motivation)
  - no chance to establish routines for new traits
    (challenging transition from R&D to routine, data quality issues, ...)

PERSONAL EXPERIENCE / OPINION

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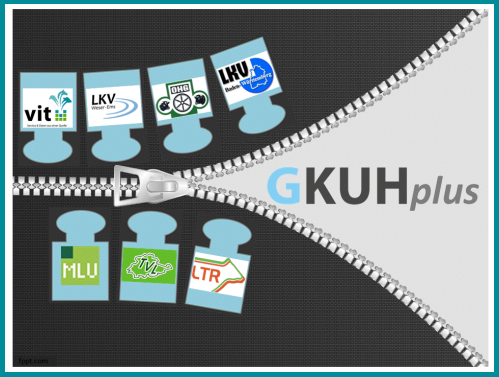

Thank you !

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rentenbank
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