WG functional traits

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

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WG functional traits

ICAR working group on "recording, evaluation and genetic improvement of functional traits in dairy cattle" (ICAR 2000)

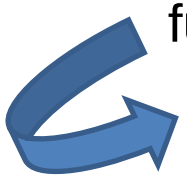
- supply member organizations of ICAR with recommendations (standards and guidelines) on recording schemes, evaluation procedures and genetic improvement schemes for functional traits
- portfolio of recommendation sheets on recording, evaluation and genetic improvement for functional traits in dairy cattle

→ broader view: functional traits in cattle, i.e. dairy + beef



Recording & use of functional traits

- shifting focus of interest from production traits (milk yield, milk composition; weight gain) to functional traits, i.e. traits influencing production or production conditions
- "increasing importance of functionality in dairy farming"
- <u>issues:</u>
  - heterogeneous and often vague trait definitions,
  - considerable differences in environment and recording conditions,
  - non-standardized recording ("stand-alone solutions"),
  - limited knowledge about international activities concerning functional traits



ICAR survey of WG functional traits

ICAR Survey (rationale)

- overview about current and future role of functional traits
- interpretations of functionality / functional traits in different countries
- plans and actions to improve functionality
- identification of needs and options for exchange of information and experiences
- possible support by the ICAR WG functional traits (expectations, working priorities)

Survey response

- official mailing list of ICAR
  → all ICAR member countries (N=52)
- total no. of countries responding: N=27

THANK YOU!

N=2 countries without functionality improvement programs

Chile, Greece

N=25 countries with functionality improvement programs

- only beef 1 country

  Australia
- only dairy 12 countries

  Argentina, Belgium, Canada, Denmark, Estonia, Hungary, Jersey Island, Korea, Norway, Poland, Romania, Uzbekistan
- dairy+beef 12 countries

  Austria, Croatia, Czech Republic, Finland, France*, Germany, Ireland, Lithuania, The Netherlands, Portugal*, Slovenia, South Africa

Survey basics

Questionnaire (20 questions)
I. General role of functional traits
II. Direct health traits
III. Other functional traits
IV. Future perspective of functional traits

Groups of functional traits

- calving traits,
- fertility traits,
- longevity,
- feet & legs,
- indirect health traits, i.e. health traits based on indirect measures of diseases (for example somatic cells for mastitis),
- direct health traits, i.e. health traits based on direct disease information (for example veterinary diagnoses),
- others (milkability, temperament, BCS, feed intake)

Answering options

- project status ("will possibly", "will definitively"), routine
- room for comments, remarks, explanations, ...

I. General role of functional traits

Genetic evaluations (EBV) and genomic evaluations (gEBV) for functional traits in 23 countries:

EBV P1 = possibly in the future, P2 = definitively in the future, R = routine;
gEBV N = no, P = project status, R = routine

Group of functional traits	**EBV P1 (gEBV N-P-R)**	**EBV P2 (gEBV N-P-R)**	**EBV R (gEBV N-P-R)**
Calving traits	2 (2 - 0 - 0)	3 (2 - 1 - 0)	18 (5 - 4 - 9)
Fertility traits	2 (2 - 0 - 0)	1 (1 - 0 - 0)	20 (5 - 6 - 9)
Longevity	2 (2 - 0 - 0)	4 (3 - 1 - 0)	17 (5 - 4 - 8)
Feet and legs	2 (2 - 0 - 0)	3 (2 - 1 - 0)	17 (2 - 7 - 8)
Indirect health traits	0 (0 - 0 - 0)	2 (1 - 1 - 0)	20 (7 - 4 - 9)
Direct health traits	10 (10 - 0 - 0)	1 (0 - 1 - 0)	7 (1 - 4 - 2)
Others	0 (0 - 0 - 0)	0 (0 - 0 - 0)	5 (1 - 0 - 4)

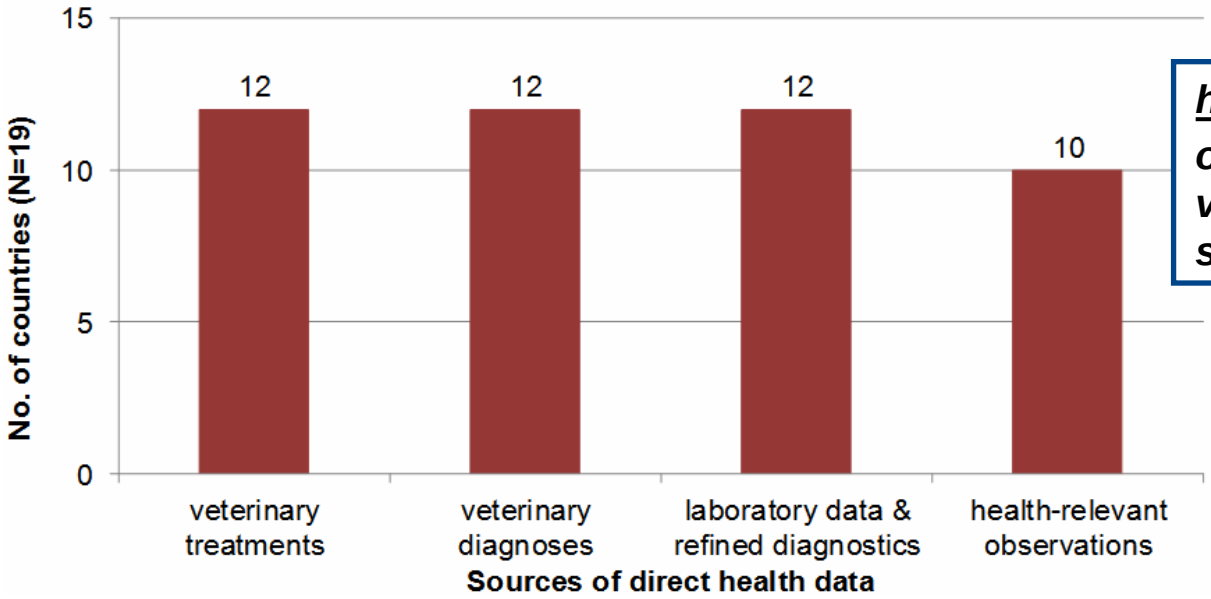
II. Direct health traits

- general approach of health data collection
  - data sources (What ?, Who?, How?),
  - spectrum of health data,
  - aims of health data analyses
- health data analyses
  - current status,
  - primary target group,
  - structure of health reports,
  - genetic evaluations for direct health traits

II. Direct health traits

Data sources & contents

– basis of health monitoring systems (data)
  - single source (type) of health data: < 1/3 of countries
  - most frequent combinations: treatments & diagnoses (N=10) > treatments & lab. data (N=8) > diagnoses & health obs. (N=7)

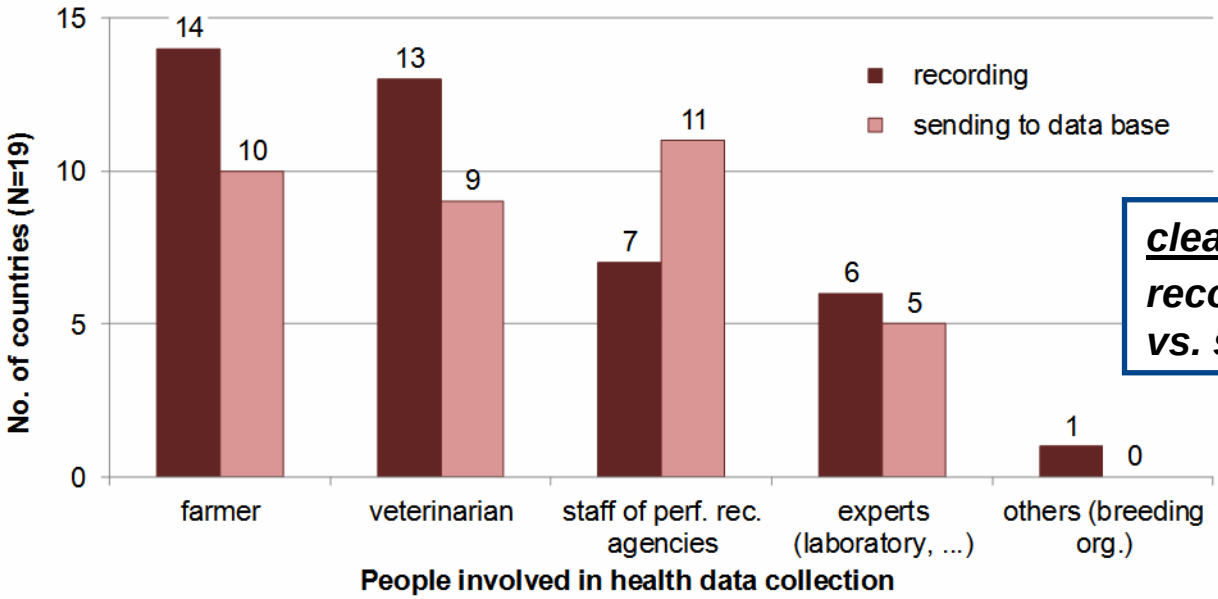


health-relevant observations:
on-farm recording as valuable (supplementary) source of direct health data

II. Direct health traits

People involved in data collection

- basis of health monitoring systems (people)
  - single group of people involved: 1/3 of countries
  - most frequent combinations:
    recording farmer & vet. (N=10) > farmer or vet. & staff PRA (N=4)
    sending vet. & staff PRA (N=6) > farmer & vet. or staff PRA (N=5)

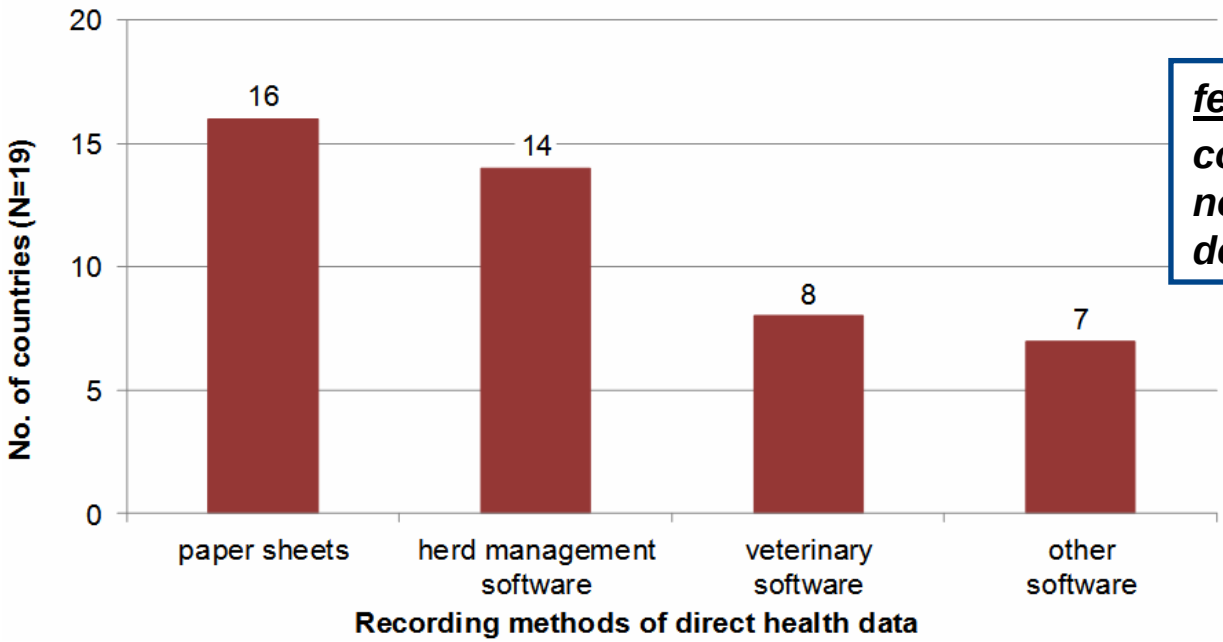


clearly defined responsibilities:
recording
vs. sending to central database

II. Direct health traits

Methods of data collection

- basis of health monitoring systems (methods)
  - single method of recording: <1/3 of countries
  - most frequent combinations:
    paper & HM software (N=12) > paper & vet. software (N=8)

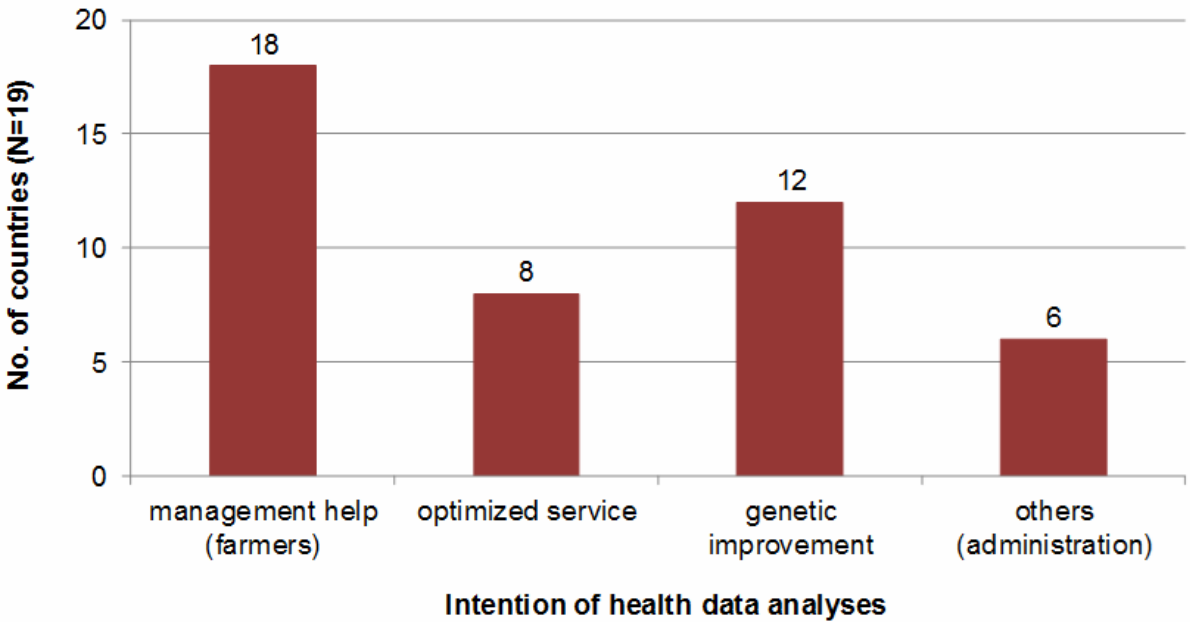


feasibility-oriented recording:
combination of non-electronic + electronic documentation

II. Direct health traits

Data analyses & intentions

- spectrum of health traits (specificity)
  - few simple traits: <1/2 of countries
  - broad range: 1 to >900 health traits
- short-term + long-term benefits of health monitoring



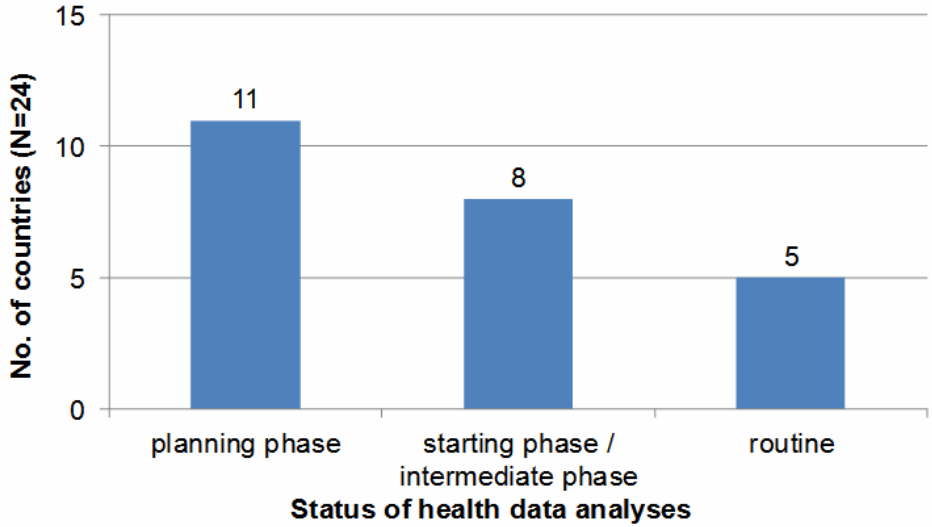
multi-purpose analyses:

visible benefits of health monitoring ensuring continuing engagement of involved parties (motivation aspects)

II. Direct health traits

Implementation of analyses

- implementation status
  - wide spread of health initiatives, but analyses mostly under development rather than routine
  - health reports: primarily for farmers, vertical + horizontal statistics



Type of statistics	No. of countries (N=20)
Within-herds (vertical) only	8
Between-herds (horizontal) only	1
Within-herds (vertical) + between-herds (horizontal)	10
Upon request	1

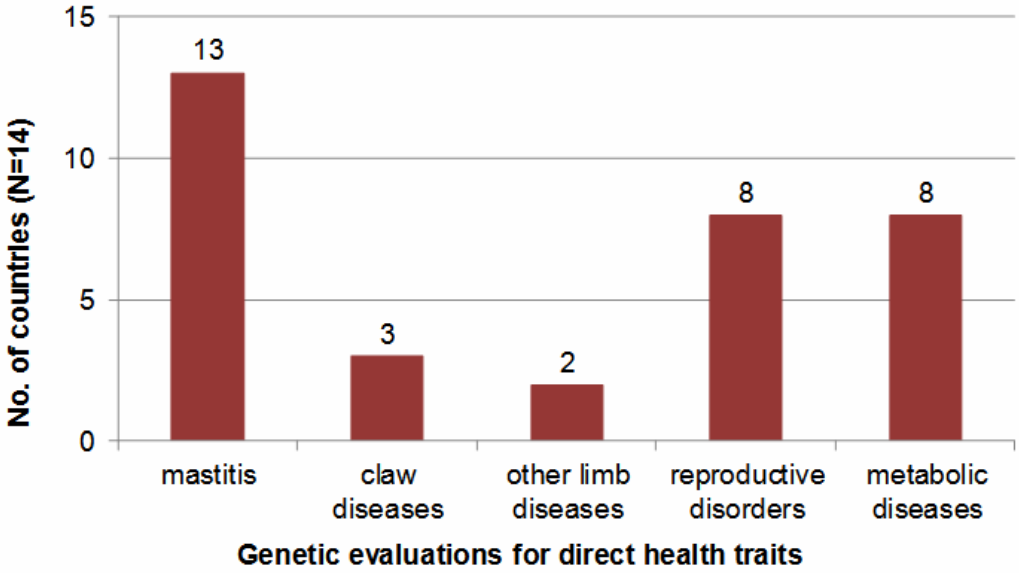
competitive aspects:

visible advantages over existing monitoring systems (herd management) ensuring continuous data flow

II. Direct health traits

Breeding for improved health

- genetic evaluations for direct health traits
  - trait spectrum (advanced projects, routines) influenced by data collection approaches
  - dominance of traits with close relation to production, under-representation of locomotory diseases

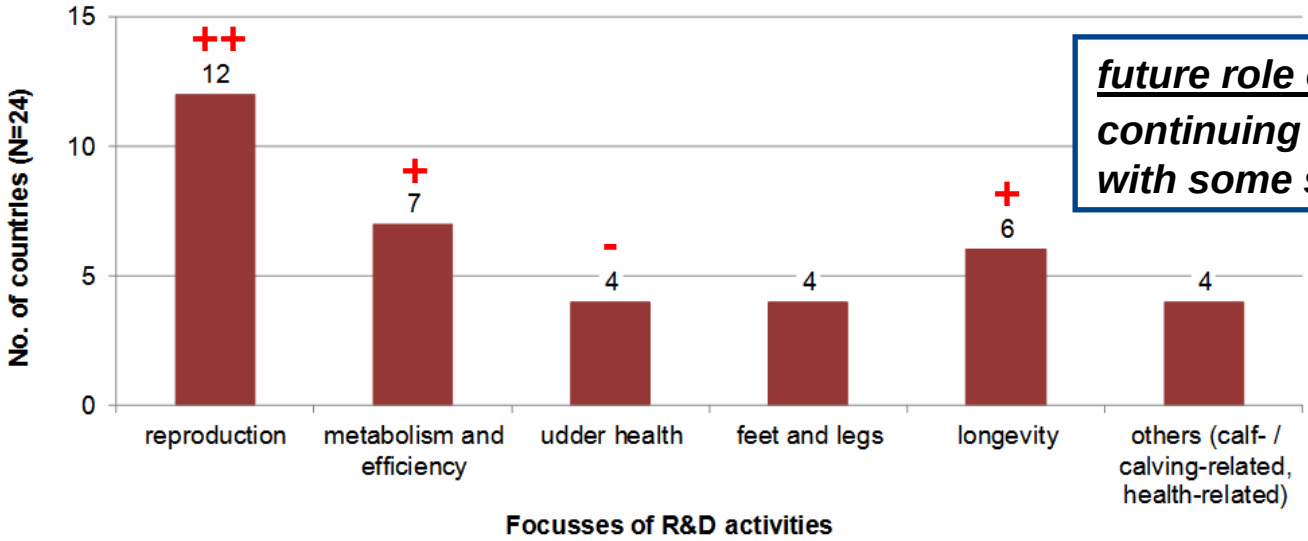


current role of health traits:

GE focusses ≠ disease focusses (main health problems)

Functionality and breeding

- EBV for functional traits
  - publication of EBV for up to 43 functional traits in 24 countries
  - expected increase in 20 of 23 countries
- areas of functionality with most intense R&D activities
  - expectations only partly reflecting needs for catching up

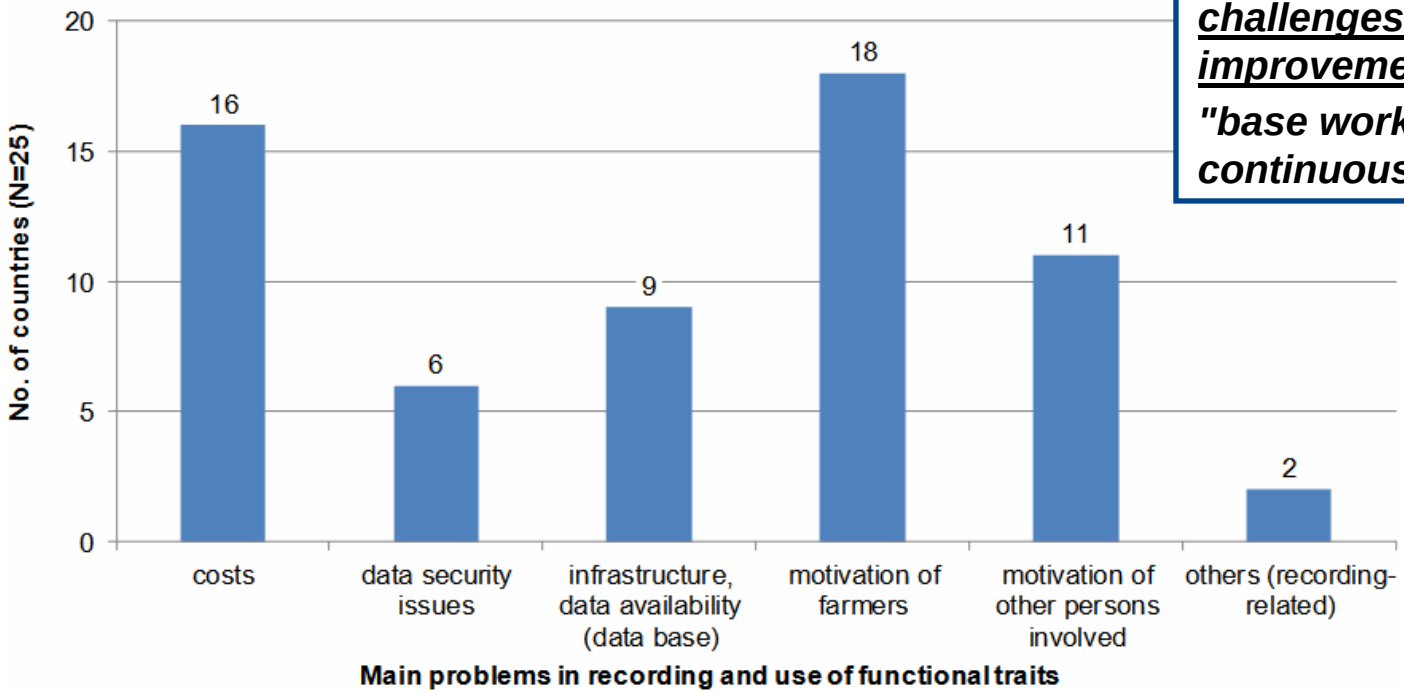


future role of functional traits:
continuing increase of importance with some shift of focusses

IV. Future perspectives

Functionality and role of ICAR

- main interferences with extended functionality orientation
  - implementation vs. continuation problems
  - options for ICAR activities?



challenges of functionality improvement programs:

"base work" (insurance of continuous data flow)

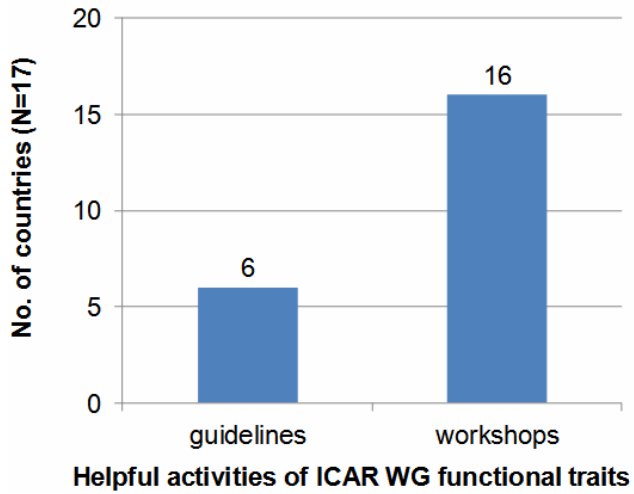
IV. Future perspectives

Functionality and role of ICAR

- main interferences with extended functionality orientation
  - implementation vs. continuation problems
  - options for ICAR activities?

challenges of future WG work:
coordination of expertise exchange

- possible support by ICAR WG functional traits
  - limited demand for guidelines for new groups of functional traits
  - organization of (multidisciplinary) workshops or seminars



ICAR Survey (conclusions)

- agreement on the still-increasing importance of functional traits and functionality improvement programs
- intense R&D activities, particularly in health traits
  - at least some plans of health data analyses in 24 of 27 countries
  - different approaches, but similar challenges → ICAR guidelines
- improvement prospects within established groups of functional traits
  - reproduction → ICAR guidelines
  - ...
- request for specific ICAR workshops

Recent activities of the ICAR WG functional traits:
ICAR guidelines for Recording, Evaluation and Genetic Improvement of Health Traits
ICAR guidelines for Recording, Evaluation and Genetic Improvement of Female Fertility (draft)

THANK YOU

ICAR WG functional traits appreciates your valuable contributions:

Argentina,
Australia,
Austria,
Belgium,
Canada,
Chile,
Croatia,
Czech Republic,
Denmark,
Estonia,
Finland,
France,
Germany,
Greece,
Hungary,
Ireland,
Jersey Island,
Korea,
Lithuania,
The Netherlands,
Norway,
Poland, Portugal,
Romania,
Slovenia,
South Africa,
Uzbekistan

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