

# Farm centric and *equifinal* approach to reduce production diseases on dairy farms



Albert Sundrum<sup>1</sup>, Ulf Emanuelson, Christine Fourichon, Henk Hogeveen, Richard Tranter, Antonio Velarde

<sup>1</sup>Department of Animal Nutrition and Animal Health, Faculty of Organic Agricultural Sciences, University of Kassel, Germany  
Sundrum@uni-kassel.de

## Introduction

Negative side effects of the production process on animal health have been discussed since the first ICPD in 1968. Intensive research has been conducted on ways of reducing production diseases (PDs). Nevertheless, dairy farms continue to be plagued by a high prevalence of PDs, adversely affecting productivity, reproduction and animal welfare.

Research in animal science has developed many tools under experimental *ceteris paribus* conditions to improve cows' health. However, **effectiveness** of interventions is difficult to predict due to the fact that it is generally context-variant to a high degree and often lacking external validation. Before interventions are considered, economic estimations are required to enable the most **efficient** use of financial and work time resources (Fig. 1).

An interdisciplinary EU-project (IMPRO) aimed to investigate and promote alternatives to a context-invariant handling of tools and measures using a farm centric and *equifinal* approach to reduce PDs in dairy farming (Fig. 2)

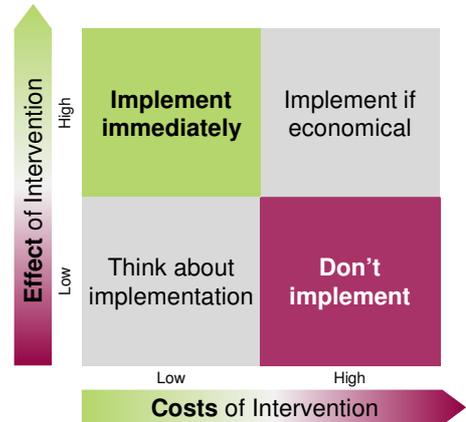


Figure 1: Essential precondition for the implementation of expertise into practice is the knowledge about the effectiveness and the costs of measures under farm specific conditions

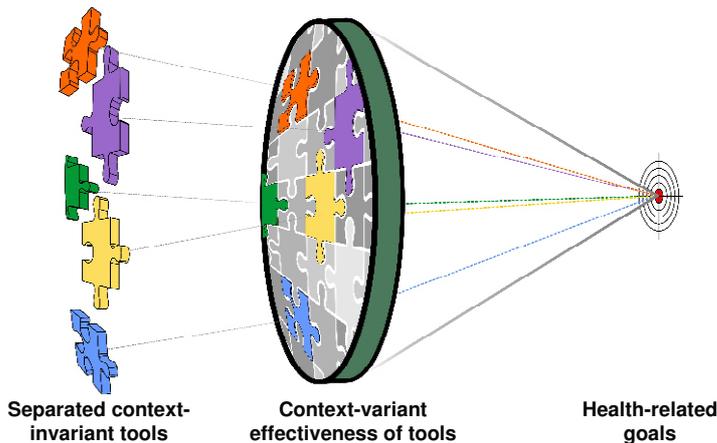


Figure 2. *Equifinal* approach, considering single measures, interrelated with the farm specific context in striving for improvements by focussing on a health related goal

## Material & methods

*Equifinal* means that the same end state (a low level of selected PDs on the farm level) may be achieved via different paths. Due to the very heterogeneous conditions under which dairy cows are held, generalised recommendations for the implementation of health measures are often both ineffective and inefficient. This results in hindering farmers' readiness to invest in, potentially costly, health measures. Farmers often do not know which measure they should prioritize in order to combat particular problems and which investments could provide an appropriate return of investment.

The new alternative approach is based, inter alia, on an impact matrix as a participatory tool (involving farmer, veterinarian and advisor) for: diagnostic work of interactions; evaluation of farm-specific costs; and possible benefits of recommended measures and construction of benchmarks for achievable PD levels.

## Results

The tool has been created to provide ways of reducing selected PDs (mastitis, metabolic and fertility disorders, and lameness), using particularly data from monthly milk records. The first version of the innovative system-diagnostic tool has been used on 192 farms: 60 in Germany, 23 in Spain, 54 in France, and 55 in Sweden. Farmers and advisors saw the approach as useful and indicated that 95% of the farmers had implemented one or more preventive measures.

## Conclusions

- The Impact Matrix is expected to **capture and reduce** the **complexity** of animal health related factors on **farm level**.
- The concept enables farmers to **identify effective measures** and to **invest resources** (labour time and investments) more **efficiently**.
- The feedback from the project was encouraging and provided positive incentives for further development of a farm level diagnostic approach overcoming faults in previous approaches towards the reduction of PDs.

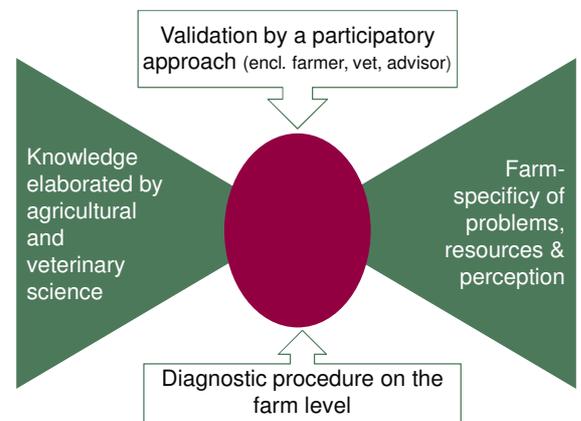


Figure 3. Reduction of complexity by synchronizing appropriate knowledge to solve problems with the farm specific problems in striving for an improvement