

IMPACT MATRIX AS A MANAGEMENT TOOL FOR COMPLEX SITUATIONS

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ANIMAL HEALTH = EMERGENT PROPERTY OF THE FARM SYSTEM

Introduction

- Dairy farmers are challenged to understand **predominant processes**, influencing the occurrence of diseases.
- Mono-causal relationships are not sufficient to explain **multifactorial** production diseases.
- The great number of interrelations requires a systemic approach to deal with **complexity**.
- The integration of **different sources of knowledge** into a coherent concept is the major challenge (Fig. 1).
- In addition cross-sector **economic analysis** is needed to enable the most **efficient** use of limited resources (Fig. 2).

DIAGNOSTIC PROCEDURE ON FARM LEVEL

Material & methods

Applying an impact matrix on 200 dairy farms in four European countries following defined steps (Fig. 3).

- Supporting farmers, advisors and veterinarian to get a **picture of the whole farm system**
- Focusing on **interrelationship between key factors** within the system (Fig. 4)
- Evaluating the **systemic roles** of each factor in the specific farm situation
- Identifying most **sensitive areas** for intervention

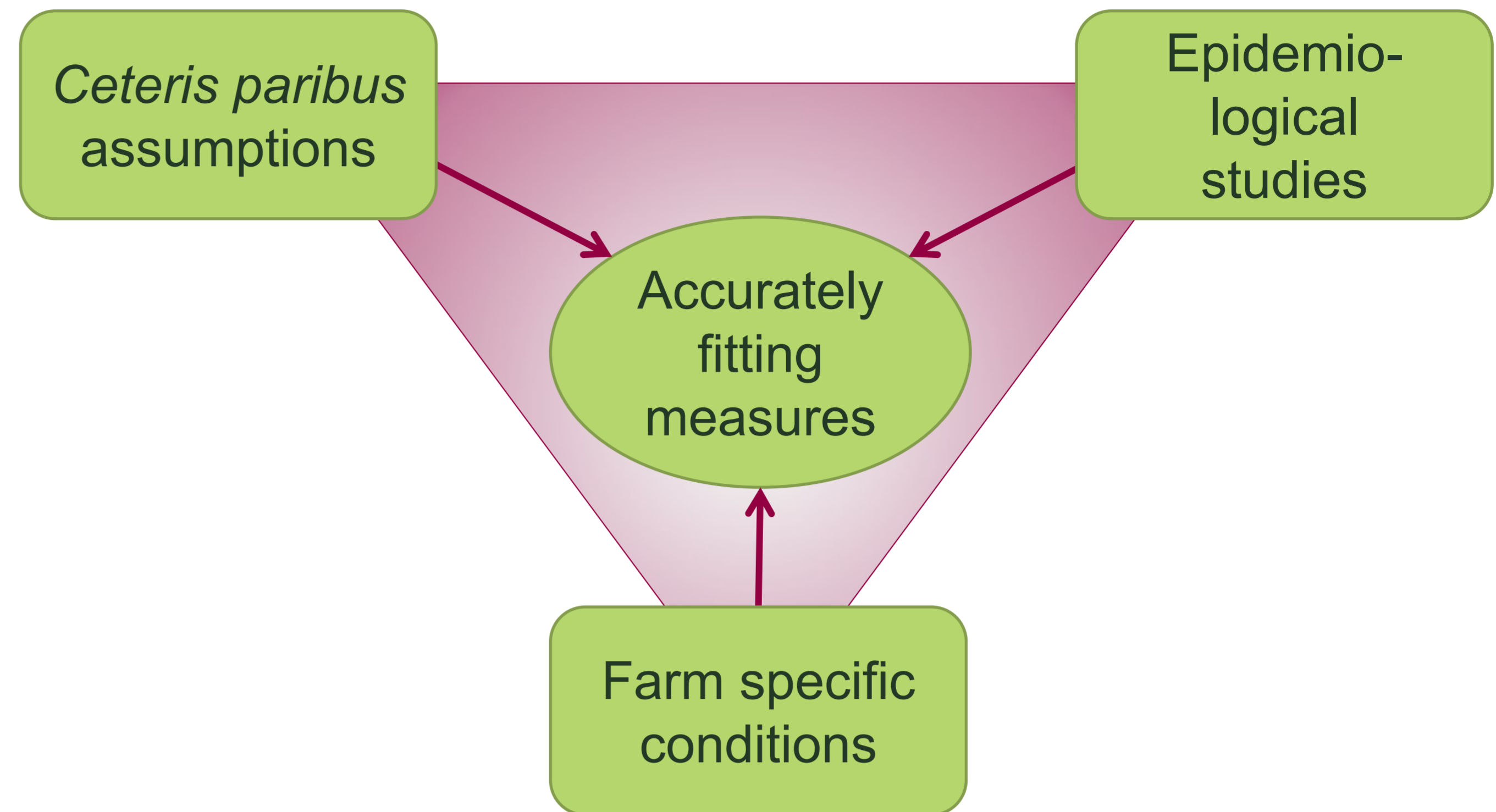


Figure 1: Integration of different sources of knowledge into a coherent concept

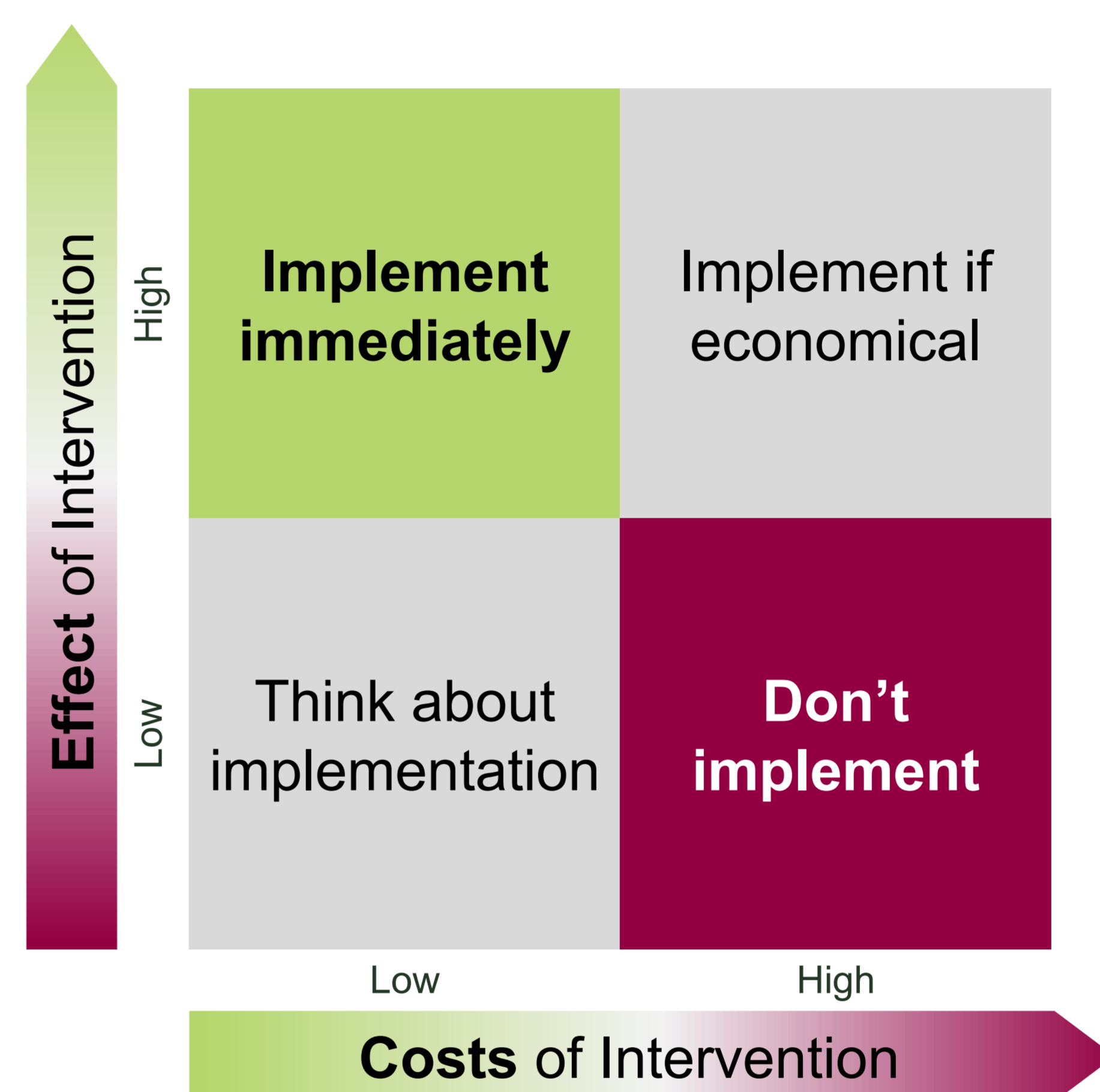


Figure 2: Essential precondition for the implementation of expertise into practice is the knowledge about the effectiveness and the costs of measures under farm specific conditions



Figure 3: Steps of assessment using the impact matrix, following the concept of Vester (2007)

SCORING INFLUENCE

If Variable A changes, to which degree (in whichever direction) would Variable B change?

Variable Nr.	Influence by variable (A) on variable (B)	1	2	3	4	5	6	7	8	9	10	Active Sum
1	Housing conditions	0	0	0	3	2	0	2	1	2	1	11
2	Use of advisory service	1	0	0	2	1	3	1	1	1	0	10
3	Milk price	1	1	0	0	1	0	0	0	0	0	3
4	Appropriate treatment	0	0	0	0	1	2	0	1	2	0	6
5	Labour capacity	2	1	0	2	0	2	1	0	0	0	8
6	Degree of data analysis	0	1	0	2	2	0	0	2	0	0	7

Figure 4: Filled Impact Matrix (detail)

The direct influence from variable A (line) on variable B (row) is scored with 0 (no influence), 1 (weak change in B), 2 (related change) or 3 (disproportionate change in the affected factor). The filled matrix is mathematically evaluated to identify the roles of variables in the farm system, depending on their interactions.

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**.

Outlook

Potentials and limitations of the impact matrix as a management tool will be assessed on 200 dairy farms in four European countries. The EU-project has started at the 1st of October 2012. For further details see

www.impro-dairy.eu.

References

Vester, F. (2007): The Art of Interconnected Thinking. Ideas and tools for tackling with complexity. MCB-Verlag München.