

## A DECISION MODEL FOR THE RISK-BASED MEAT INSPECTION

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### Introduction

The European Union is reorganizing the European food safety system. Risk-based decisions and procedures play a major part in the new European food hygiene legislation. In the year 2006, the "Regulation of the European parliament and of the council laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption" will be implemented. One of the key elements of this regulation is the transition from the "traditional" to a "risk-based" meat inspection. For the official veterinarian, this will offer the possibility to permit a mere visual meat inspection for batches of slaughter pigs, which were raised under controlled conditions and for which the information flow between farm and abattoir is regarded as sufficient for risk-based decisions. In case of epidemiological data indicating a risk, the official veterinarian can order a "traditional" meat inspection with incision and palpation for the pigs in question. To support this decision, one of the tasks of the official veterinarian will be the inspection and evaluation of food chain information. It is the task of the slaughterhouse to make the information available to the official veterinarian at least 24 h prior to the pigs' delivery to the abattoir.

### Material and Methods

The project "Border-crossing quality assurance systems in pork chains" (GIQS) is a German- Dutch research and development project which develops solutions for a better information flow and better traceability in pork production chains and for the most efficient use of the information.

The GIQS solution for information management is an internet-based, inter-enterprise data-warehouse (called "GIQS Backbone") which provides a virtual integration in pork production chains on the basis of relevant food chain information (3). This information can be used by all members of the pork production chain in accordance with an access authorization.

Farmers as well as their veterinarians and consultants can get their own reports for the enhancement of farm management, abattoirs are able to collect information for every announced batch of slaughter pigs and the official veterinarian can use the "GIQS Backbone" for making risk-based decisions.

The Basis for the decision model are two EU regulations. In one of them relevant food chain information is defined (Regulation (EC) 853/2004) and the second one deals with specific rules for official inspections (Regulation (EC) 854/2004). The requirements are brought together and a "tailor-made" system for the German, heterogeneous pig production is worked out.

The decision model is tested in practice in a pilot chain near the Dutch German border. This pilot chain consists of a slaughterhouse, the regional official veterinarians and a farmers' cooperative. Real data are used to validate and optimise the decision model and to work out thresholds for each parameter of information.

### Results

The report for the official veterinarian is put into a decision model which may be used when slaughter pigs are announced for slaughter and the food chain information is to be judged. The decision model is to support the official veterinarian in making risk-based decisions, it consists of a system for evaluating and using the very complex food chain information.

The decision model works like a cascade with three steps to evaluate relevant information about a batch of slaughter pigs (2):

1. On the first level it is judged, if the flow of information between the holding of provenance and the slaughterhouse is sufficient.
2. On the second level, information about the holding of provenance must be appraised.
3. On the third level, Information about the specific lot announced must be appraised.

To make this cascade work, data from farms, slaughterhouses and official veterinarians are brought together. At present, in Germany, information about eight relevant parameters is available:

1. Participation in a neutral certificated quality assurance system.
2. Housing factors and the farm's hygiene management.
3. The farm's Salmonella status.
4. Slaughter check data of previous slaughtered batches of pigs. To quantify this descriptive information, a slaughter check index has been developed (see figure 1).
5. Official findings and condemnations of previous batches of slaughter pigs.
6. The farmer's reliability of his delivery management.
7. The health status of the finishing pigs and medications.
8. The mortality in a group of finishing pigs.

Pneumonia Frequency within the last two years	P o i n t s	Pleuritis Frequency within the last two years	P o i n t s	Liver Fre qu ency with in the last two years	P t s	Pericarditis Frequency within the last two years	P o i n t s
<1%	0	<1%	0	<1%	0	<1%	0
1-10%	1	1-10%	1	1-10%	1	>=1%	1
11-30%	2	11-30%	2	11-30%	2		
>30%	3	>30%	3	>30%	3		

All the Points are summed up, a farm can reach between zero and ten points in the slaughter check index.

0 Points: desirable low frequency of occurrence of lesions

1-3 Points: low frequency of occurrence of lesions

4-6 Points: medium frequency of occurrence of lesions, the herd health should be checked by a consultant or a veterinarian.

7-10 Points: high frequency of occurrence of lesions, indicates strong problems with the herd health on the farm

Figure 1: Slaughter check index (modified after (1))

In combination with the data-warehouse “GIQS Backbone”, there is a good possibility to visualize the decision parameters for the every-day-use by the official veterinarian.

A “traffic light system” was developed to demonstrate the thresholds of every parameter. Before admitting a batch of pigs for slaughter in the framework of risk-based meat inspection, the official veterinarian will look up the visualized relevant information in the “GIQS Backbone”. He or she will see eight different traffic lights, one for each parameter (see figure 2).

When the traffic light is green, it means, that there are no obvious problems with this parameter in that batch of slaughter pigs.

A yellow traffic light indicates a warning.

A red traffic light is shown, when the threshold for a parameter has been passed.

Detailed information behind the traffic light is available for the official veterinarian at a mouse-click.

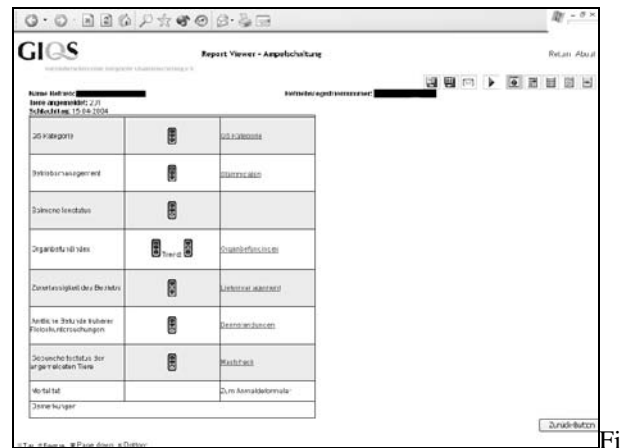


Figure 2 : traffic light system

### Discussion

The decision model is to support the official veterinarian in making meaningful decisions, but still his or her expert knowledge is the most important instrument for the risk-based meat inspection. He or she makes the official and final decision, which meat inspection procedure fits best for an announced batch of slaughter pigs. The decision model makes use of modern information technologies and enables the official veterinarian to evaluate lots of information in a short period of time.

### Conclusions

It is widely thought that risk-based meat inspection is only possible in strictly integrated systems. However, our findings indicate, that a well coordinated information flow is more important than the integration degree of a food production chain.

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