

Safety management in zootechnical breeding

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Abstract

The aim of this study was to create a new model for the safety management, through the analysis of the risks and the economic appraisals for the improvement of working conditions. The analysis and samples put in evidence the critical situation in the zoo-technical breeding. Numerous critical point in every workspace were found. Workers of this area have a great underestimation of the danger, and a lot of them often does not inform the employers on the real risks of job activity. This study put the bases for the characterisation of new methodologies and instruments in the safety area.

Keywords: stable, model, farm.

Introduction

Over the years from 1970 to 1980 the zootechnical field undergone to a deep transformation. If on one hand the number of farm workers has been reduced on the other side an intense industrialization, with the application of new technologies to different productive phases, has been established.

From statistics cow breeding result as the agricultural activity that alone records the 33% of all accidents at work. In animal farms milking rooms and areas dedicated to free animal stabulation are related with an high frequency of accidents (INAIL statistics, 1998-2000).

Technological innovations applied to animal farming led to a substantial improvement of work conditions but also to a modification and enlargement of some risk factors. This risks are often related to a modern work organization characterized from high fragmentation of processes, presence of repetitive tasks and use of numerous chemical substances. Employers use methods and tools that have been rapidly changed and renovated, furthermore shortage of labour, in some regional reality, has been led to the engagement of workers, coming from different countries, cultures and working environment, in numerous zootechnical productive processes. Information and prevention are key medium to avoid and reduce the most of accidents. The first action to perform is to assure a correct farm organization starting from planning time. In this phase is still possible to optimize productive options on the basis of normative bonds, especially about safety of farm labourers and animals. Considering the continuous technical and technological development in farming animals, farmers have to confront with a dynamic situation that includes fast transformations and changes in destination of pre-existing constructions. This aspect could raise to an increase of risk coefficients because old constructions like stables or barns often are not conformable to new methods and productive processes. From these considerations appears the necessity to adjust

productive structures and plants on the basis of the specific production activity and processes. The aims of the study are in order:

- to produce a revised evaluation of farms safety;
- to underline critical aspects of farms considered in the study;
- to classify farms in accordance with specific standards of risk evaluation;
- to identify and employ tools useful for breeders in evaluating safety conditions within frameworks.

Materials and methods

The study has been developed in four steps:

1. A planning and cognitive phase concerning the creation of a farm list and a evaluation model to perform risk analysis;
2. An analytic phase to perform concretely risk analysis within farms;
3. A data elaboration phase fundamental to identify critical areas within each farm and each evaluation class;
4. An application phase to prepare a safety improvement plan.

The research has been performed considering four heterogeneous farm batches to have a global vision of the zootechnical sector (Table 1). In particular farms has been classified on the basis of production (milk and meat).

Table 1. Sample description

	farm 1	farm 2	farm 3	farm 4	farm 5
employees	5	7	7	1	1
production	milk	meat	meat	meat	meat
animals	1600	15	3459	500	1600
stables	4	1	6	1	1

Sampling has been performed in Friuli Venezia Giulia and Veneto region between October 2007 and January 2008. To complete the risk analysis a check-list, branched in macro-areas and topics, has been used. Check-list is a preparatory instrument to research and identify potential risk factors.

Table 2. Research areas

Research areas
Viability and access systems
Structures, deposits
wiring, other plants
tractors, agricultural machines, stables and equipments
veterinary products,
noise-vibrations
safety management , safety

For each check-list macroarea some indications has been reported to orientate the responsible of risk analysis. Each macroarea has been divided into subclasses that represented homogeneous areas of activity and risk. During risk analysis is also necessary to consider the severity and the frequency of accident by means of this formula:

$$\text{RISK} = \text{magnitudo} * \text{frequency}$$

Where magnitudo indicate the severity of the potential accident and frequency the number of a particular accident type in course of time. The score to be assigned during evaluation follow a scale from 1 to 9. Values of respective attributes, frequency of accident and assessment on each score, are reported in table 3.

Table 3. Judgement score used during risk analysis

Score	Frequency	assessment
1	low	insufficient risk
2	medium	insufficient risk
3	low	insufficient risk
4	lov	medium risk
5	medium	medium risk
6	medium	medium risk
7	high enough	important risk
8	high	remarcable risk
9	high	high risk

Results

Viability and access systems

About this category a substantially homogeneous situation was observable between farms and each unit reached a collocation of middle risk (Figure 1).

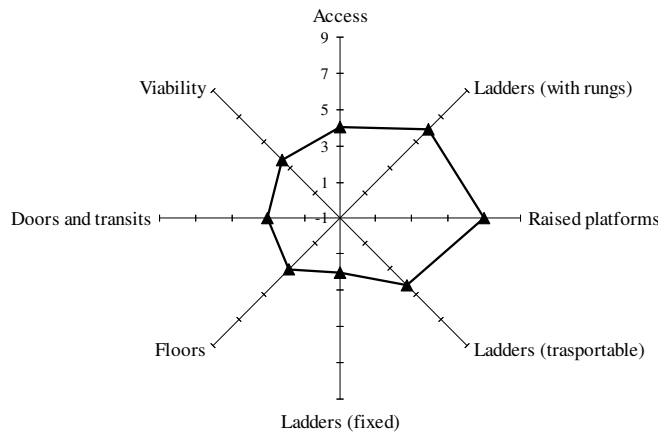


Figure 1. Risk representation of viability and access ways

All units obtained positive scores about dimensioning of farm building and entrance. Warning signage represented a critical aspect of this area and was lacking in all farms.

Buildings, productive structures and deposits

In Figure 2 is represented the considerable presence of dangerous situations pertinent to this area: a great part of units presented also an high risk score.

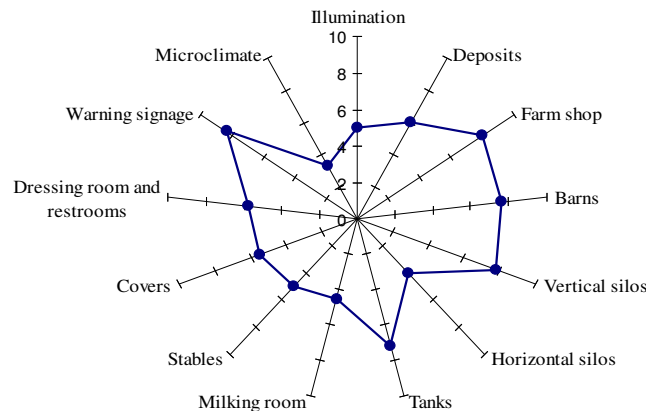


Figure 2. Risk representation of productive structures

Numerous deficiencies were observed relatively to silos and farm shops management, in particular were identified some dangerous elements not in according to the law.

Plants

This category presented an evaluated middle-high risk level. All farms were lacking of emergency illumination devices and were characterized from a real absence of technical systems servicing.

Machinery and works

The category "machinery and works" obtained a medium risk evaluation for all the sample.

Tractors, elements obviously common for all the farms, obtained evaluations near the limit of serious risk. A general lack have been observed in the servicing and use of the machines.

Chemical defence

The problems of this category showed a medium-high risk situation (Figure 3).

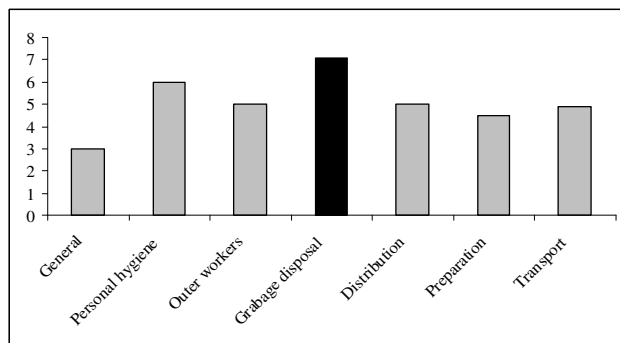


Figure 3. Risk distribution of use of chemical substances

A heavy negative evaluation was observed for the practice of throwing away the wastes (Figure 10). Farms does not perform differential collection, but frequently adopt the forbidden practice of burning the wastes produced. Also the personal hygiene has not received a positive evaluation.

Noise, vibration and asbestos

Heavy risk situation have been observed also in the category "noise, vibration and asbestos" (Figure 4). One of the reasons for a so negative evaluation is the general lacking of knowledge from the employers that have never measured the degree of danger in their farm.

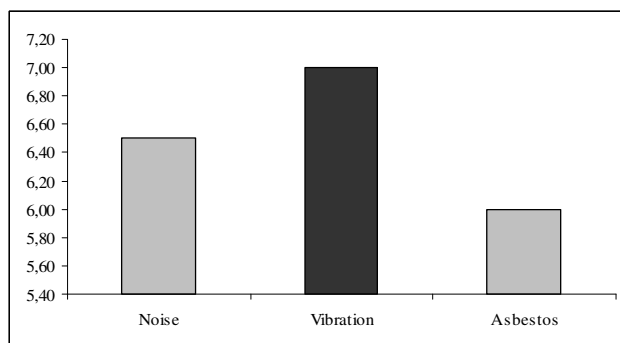


Figure 4. Risk distribution of noise-vibration-asbestos

Management

About management the situation is homogeneous for all the farms. There is only a case in which a low risk condition has been observed, while for the other four farms has been identified an high risk condition (Figure 5).

Farms 4 and 5 showed the higher values of risk, due to great lacking in work organisation.

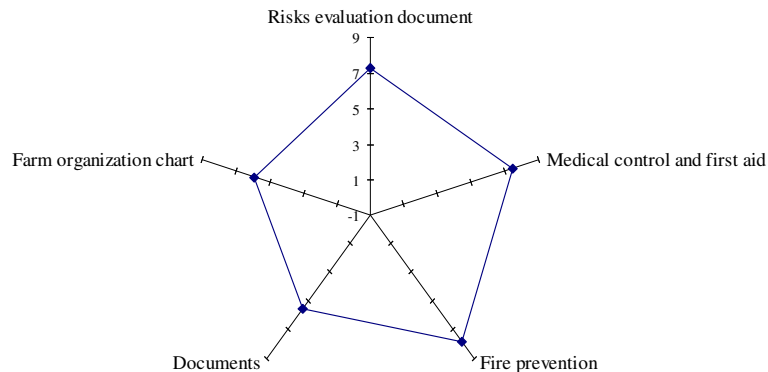


Figure 5. Risk representation of managerial area

Conclusions

Results have shown that the zootechnical area is an high risk field, both for the frequency and the severity of accidents. The areas that received the lowest security evaluation are:

- barns and garage;
- systems;
- machinery services;
- use of chemical defences;
- carelessness in the noise and vibration derived risks;
- farming management.

The lacking of a culture of ordinary services corresponds with a carelessness in the information and training of workers. A linear indirect correlation was observed between number of operators and the security evaluation of farms analysed (Figure 6).

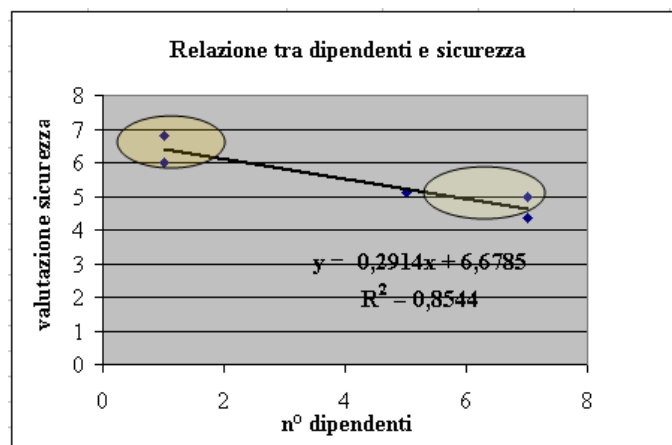


Figure 6. Linear indirect correlation between number of workers and security evaluation of farms

This distribution shows a decrease in the number of defaults with an increasing number of working people. The explanation of this trend could be the fact that there are still many farms with only one operator that often coincides with the owner occupier. In that case security becomes an optional, a not necessary investment.

In conclusion it becomes clear that the problem considered in this work is largely underevaluated. For these reasons it is necessary a greater divulgation of the matter by the media system.

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