

Safety at work in livestock and poultry farms in South-eastern Sicily

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Abstract

The present study analyses the standard of adjustment to the rules concerning health and safety at work in the livestock and poultry farms in Sicily, with specific reference to ones sited on the Hyblean Plateau.

We examined nineteen farms having at least one employee which is the prerequisite condition to be liable to guidelines of the Italian legislative Decree n. 626/94, recently substituted by the Italian legislative Decree n. 81/2008. Employers and workers were given four check lists that aimed to identify the standard of "objective" adjustment concerning conditions of buildings and facilities.

The results have highlighted that the livestock and poultry farm conditions are highly unsatisfactory in terms of adjustment of the building, as well as the correct way of using them and the knowledge of procedures as for the workers.

Therefore, it is important to find strategies to train employees and employers about health and safety at work.

Keywords: livestock farms, risk prevention, check list.

Introduction

In Italy, for some years now, there is a gradual reduction of accidents at work in agriculture (fig.1). This trend is confirmed also in the reduction of cases of accidents recorded in Sicilian farms (fig. 2). In the same period, the accident rate (ratio between the number of accidents reported and number of employed in agriculture) are decreasing in Sicily, from 3.2 in 1999 to 2.2 in 2006 and in Italy from 8.1 to 6.7. It isn't sure if these positive results can actually be attributed to the adjustment of the farms to the rules about health and safety of workers and to the employers' awareness of safety problems (Salvati, 2003). In particular, although for many years there have been specific rules (Italian legislative Decree n. 626/94; Italian legislative Decree n. 547/55) imposing the necessity of achieving adequate safety and health levels, in most small farms the work is not always carried out with awareness of the risks and with adequate knowledge of prevention and protection measures that limit those risks.

The objective of this work was to verify the current level of adjustment of livestock and poultry farms to the safety regulations. In this respect, it was identified a sample of livestock and poultry farms in an area representative for the characteristics and the size of livestock farms in Sicily. The considerations set out below focus the fields where the problems in workplaces are larger.

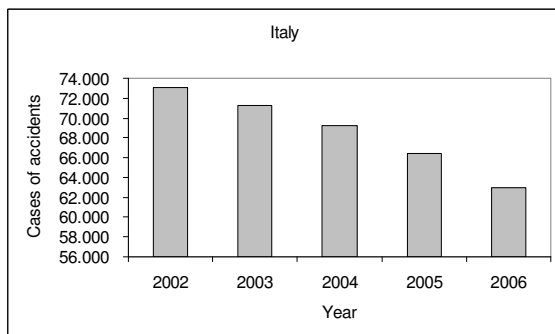


Figure 1. Trend of agriculture work accidents in Italy

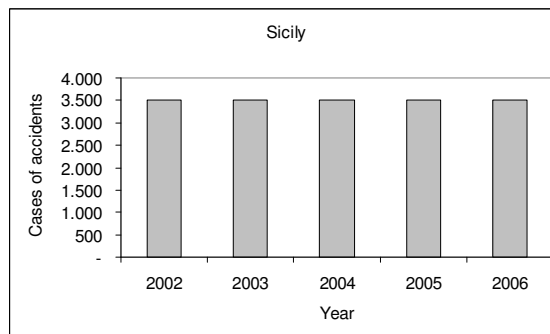


Figure 2. Trend of agriculture work accidents in Sicily

Materials and methods

The study was conducted during the year 2004 on a sample of nineteen livestock and poultry farms, located on the Hyblean Plateau. This area of investigation was chosen for the strong agricultural vocation of South-eastern Sicily where, in particular, there is the largest number of livestock farms of the island. Most farms sited on the Hyblean Plateau have small dimensions in terms of number of bred animals and of available farm land. Furthermore, those farms are managed by a single farmer who carries out all activities to the management of the farm (ISTAT, 2002). Since this characteristic excludes farms from their obligations of safety rules, in this study were selected only the farms with at least one employee (Soprani, 2003), taking care of forming a representative sample of animal species bred in the examined area. Then, the sample selected consists primarily of dairy farms, while in a lesser extent there are herds of pigs and laying hens.

Check lists are frequently used to identify potential sources of risk to workers and to design rational prevention programs of accidents in workplaces. The check lists contain statements and/or questions involving two possible responses: true or false. They are effective for the recognition of non-compliance regulations and techniques, as well as for the planning of good safety management systems. In addition, experience has shown that the use of check lists reduces the human commitment and the economic resources for risk analysis and supports the control and the update of prevention and protection interventions (Enama, 2002).

To obtain the data needed to achieve the objectives of this work three check lists have been used (Cascone *et al.*, 2004; Zappavigna *et al.*, 2006).

The check lists were compiled through surveys and direct interviews to managers and workers. Their use made it possible to analyze three different areas: the typology of the farm, the general features of the farm, the prevention and the protection against risks, the buildings and the installations.

The check list "Farm typology" contains data on animal breeding and animal housing, on the management of feeding and manure, on crops and on the use of machines.

In the checklist "General data" three main areas of interest were grouped: the form of management, the staff employed and the organisation of the Service of Prevention and Protection against Risks (SPPR).

The check list "Buildings and Facilities" examines the safety conditions of the buildings and of the relative installations. To simplify the filling of the check list, the entries were organized in the following groups: access and viability, doors and gates, flooring and walls, stairs, raised platforms, lighting and microclimate, roofing, tanks, silos, barns, machine shops, electrical equipments, noise, biological contaminations, manipulation of objects.

To each item of those three check lists was given a numerical value that measures the level of risk to which workers would be subject in the case of non-compliance with safety requirements expressed by the same voice. The possible levels of risk are three: low, medium and high. To the lower level of risk 1 point have been assigned, to the average level 3 points and to the higher level 9 points (Brugnoli *et al.*, 1999). On each item to the answer (true or false) is given a null score if it expresses the condition of conformity (true); on the contrary, if the answer expresses the condition of non-compliance (false) it is given a rating equal to the level of risk. Therefore, for each filled check list it is possible to associate to the surveyed farm a triple scoring method: a "reference score", which corresponds to the maximum achievable score, obtained by adding the scores of all voices of the checklist, excluding those not filled as not relevant or related to elements not present; an "absolute score", determined by the sum of the scores actually obtained from all the voices that express a non-conformity; a "relative score", obtained by the ratio between the absolute score and the reference score.

Results and discussion

During the first part of the survey, it was filled the part of the check list through the information obtained from interviews of the owners, concerning the "General data". This preliminary interview allows also to assess the level of detail of subsequent phases of the visit in order to compile the other check lists.

Using the relative scores expressed as a percentage it was possible to make some considerations on the overall conditions of the analysed sample, to analyse one by one the situation in each area of investigation and to compare the different farms in the sample (CSA 2000; Zappavigna *et al.*, 2002). In addition, conducting a sectorial building analysis it has been possible to identify priorities in actions.

General data and farm typology

In all farms of the sample it is carried out simultaneously livestock activity and cultivation, intended mainly to pasture and forage crops; in several cases, for special mechanised processes, farms undertake outsourcing.

Of the nineteen farms in the sample, sixteen have a legal form of ordinary partnership company directly conducted by the owner, with an average of two family components that work within the farm. The remaining three, two are joint-stock companies and one is a limited company. These last three farms, in particular, are the only that rear chickens and pigs and, therefore, less rooted in local livestock traditions.

Another important aspect emerging from the analysis of the data included in the "Farm typology" check list regards the total lack, in most farms, of the Service of Prevention and Protection against Risks (SPPR). In particular, among the ordinary partnership companies no one have established a SPPR and only in two farms the employers have attended a course concerning the issue of the safety management. The participation to that course, although not followed by any information activities and worker training, has contributed to make the worker awareness of the need of preventive and protection measures, at least for the performance of some specific activities. This leads the employers to provide their employees with Personal Protective Equipment (PPE), which are essentially: gloves, masks and boots. In all other fourteen farms organized in the form of ordinary partnership company, the problem of worker safety is almost completely ignored, thus highlighting the most serious lack common to the whole sample: the lack of information on rule duties and on the possibility to comply with the rules.

Farms which employ more than one employee not belonging to the owner's family, (the three farms that are not directly conducted by the owner) have tried to comply with the Decree n. 626/94 conducting risk assessment and creating a SPPR with the help of an external consultant who also plays the role of head of the service itself. However, the attention given to the issue of safety at work was primarily dictated by the need of being complying with the rules in case of a possible inspection by the supervisors, rather than a real need oriented to ensure adequate working conditions.

Buildings and facilities

The analysis of checklists "Buildings and Facilities" has led to a table that presents for each farm the absolute scores, the relative scores and the reference scores. Table allows to make some considerations on the level of complying with the rules for the safety of workers. In fact, the reading of data from each farm allows to understand if it was conducted a risk analysis that allows only the identification and possible resolution of the most critical situations, or if it was conducted a deeper analysis which leads to the design and implementation of prevention interventions needed.

Table 1. Number of non-compliant items, number of relevant items and percentage of non-compliant items resulted from the compilation of check lists "Buildings and Facilities"

Farm	Number of non-compliant items			Number of relevant items			Percentage of non-compliant items		
	Level of risk			Level of risk			Level of risk		
	low	medium	high	low	medium	high	low	medium	high
1	7	8	13	15	21	23	47%	38%	57%
2	7	7	7	15	17	16	47%	41%	44%
3	6	4	4	19	22	21	32%	18%	19%
4	6	7	5	16	17	20	38%	41%	25%
5	7	6	7	14	19	16	50%	32%	44%
6	7	11	5	16	19	13	44%	58%	38%
7	5	7	7	13	19	18	38%	37%	39%
8	6	8	5	15	21	14	40%	38%	36%
9	8	9	7	15	22	18	53%	41%	39%
10	7	7	5	14	18	19	50%	39%	26%
11	7	9	7	15	23	18	47%	39%	39%
12	5	7	5	15	22	22	33%	32%	23%
13	9	9	7	18	24	23	50%	38%	30%
14	6	6	6	13	17	14	46%	35%	43%
15	6	7	4	14	22	17	43%	32%	24%
16	6	6	5	14	19	16	43%	32%	31%
17	4	4	4	14	19	17	29%	21%	24%
18	7	10	10	13	20	18	54%	50%	56%
19	3	7	3	10	17	9	30%	41%	33%
Average	6,3	7,3	6,1	14,6	19,9	17,5	43%	37%	35%

With reference to the whole sample, it comes that the major defaults in complying with rules are six on average, with a minimum of three and a maximum of thirteen; these data assume greater significance when compared with the number of relevant items. Indeed, in the farm with three serious non-compliances was possible to evaluate only nine entries with a high risk. The three non-compliant items represent, therefore, one third of the total relevant items, thus highlighting a high percentage of serious inadequacies.

The most interesting result is the relative score that gives an overview of the real situation through the percentage of non-compliances which on this latter table is on average about 35%, for the level of risk "high". Only the farm n. 3 shows a percentage of defaults of about 20% compared to all the relevant items. However this latter result is a high value in order to express a positive view on safety conditions for workers. Finally, nine farms in the sample reach a score higher than average. Subsequently, data by sectors were observed, as they were indicated in the check list, in order to identify those farms which require priority actions and those farms which, in general, guarantee sufficient security levels.

Access to the farm and internal viability

The control of the outside of the buildings aims to verify their dimensions which represent a crucial aspect for reducing the risk of accidents between workers and means of transport circulating in the farm.

With regards to the easy accessibility and the possibility of movement, the 84% of the farms is in satisfactory condition, and only in three cases the situation presents significant inadequacy, since the visibility conditions in both directions is insufficient and the space for manoeuvres are limited.

The presence of subsidences and holes on the roadbed, and the consequent difficulty in removing the rainwater, is a problem common to all farms in the sample. To that issue farmers still give little importance, assuming that the experience gained in the use of machines is sufficient to ensure the safety of workers, even in situations that could become dangerous.

Doors and passageways, flooring and walls

The first clear lack in this sector is the total absence in all the farms of emergency exit in pens with presence of free animals. They are required in case of unmanageable animals, even if that risk is extremely rare in the opinion of all farmers interviewed. The doors and gates also are lacking is systems that prevent the sudden shutting for accidental causes. The most inadequacies were found for the sliding gates that in none of the reported cases have devices against the diversion.

To analyse the characteristics of flooring and wall finishes, it is necessary to distinguish the different rooms of the farm. The milking rooms are satisfactory. They, in fact, are generally equipped with non-slippery floors and walls covered with tiles to ensure the safety of milkers and adequate level of hygiene during milking routine (Failla *et al.*, 2001). However, in the breeding and outdoor areas there is a lesser degree of attention especially highlighted by the frequent presence of pavements that become slippery when wet.

Ladders and over raised floors

Ladders are frequently (68% of farms) in bad conditions. In detail, the ladders found in sixteen farms are old and rickety and should be immediately replaced with new ones satisfying the current security arrangements.

Only in a farm there are over raised floors not protected by parapets and with too sloping access ramps often travelled in reverse by car travelling. In this case, therefore, adequate protective parapets are needed in order to minimize the risks during operations on ramps and platforms.

Lighting and microclimate

Microclimatic and lighting conditions are very important because frequently are cause of occupational diseases (Frazzi and Lodigiani, 1996). In all farms natural and artificial lighting and micro-climate are satisfactory. There is only one machine shop with poor lighting, and this is probably attributable to the very rare use of such. The lamps for artificial lighting, in general, have a good level of functioning but they require more accurate maintenance. In no cases, however, there are emergency lamps.

Tanks and cisterns – Silos and barns

Only in seven farms there are cisterns for collecting water. The maintenance of these facilities is generally neglected and in all cases there are no elements of protection that guarantee the minimum levels of security against the risk of falling for the operators.

The state of silos, both horizontal and vertical, is largely satisfactory in all the farms visited. The horizontal silos are built up and are generally well proportionate compared to the loads they are called to endure. The vertical silos are prefabricated structures that require assembly and maintenance clearly defined for the security guarantees of the operators. During the survey it was verified the observance of the assembling procedure with most cars for the fixing to the ground.

The barns require more attention especially as regards the disposal of round bales. In 75% of the farms, round bales are filled overlapped, with consequent risk for the bales to fall down hurting not only workers but anyone in the proximity of the barn.

Machine shops

Only three farms are equipped with a room used as a machine shops for ordinary maintenance of machines. Properly because of their rare use, garages visited are not subject to adequate maintenance and they show lack of appropriate hardware equipment, PPE, boxes for medication and insufficient lighting.

Electrical equipments

Eighteen of the farms have electrical installations complying the rules, but only three carry out regularly the necessary periodic checks and to ensure the maintenance of all elements of the electrical installation in terms of integrity and cleaning. In just one farm, however, does not exist adjustment and maintenance of electrical installation, resulting a substantial risk of electric shock for the operators.

Noise

The problems caused by noise are among the most neglected: in no farms the overcoming of noises thresholds are evaluated, nor adequate ear protectors are used. This attitude is attributable mainly to two reasons: firstly the lack of farmer awareness of damage caused by excessive exposure to noise, with consequent underestimation of the importance of prevention; secondly the limited use of noisy machinery that induces operators to reject ear protectors.

Biological Contamination / zoonosis / sanitation

The hygienic conditions of the livestock building were investigated only by two entries in the check list: a voice analyzes the level of ventilation of the rooms, always positive checked in all farms in the sample, and a voice verifies regular cleaning of bedding and shelters, which in one case it is not respected.

All animals are subjected to regular veterinary checks and vaccinations, thus offering good guarantees in terms of prevention of possible cases of zoonoses.

Handling of objects

The problems related to manual handling of objects are neglected by employers and operators. In 90% of farms, workers are not engaged in activities that require excessive physical efforts. In the only farm in which the issue assumes importance, the employer provided mechanical means of transport for solid foods in order to reduce the physical commitment of employees.

Personal protective equipment (PPE)

The use of PPE is limited to boots and, in a few cases, to work gloves; in none of the farms examined operators wear gloves and masks for the operations in the livestock building and field or during the application of garrison sanitary. In three farms employers have purchased to workers masks and gloves, whose use remains however sporadic.

Conclusions

The analysis of check lists compiled during the survey to a sample of farms sited on Hyblean Plateau has supplied information concerning the adjustment of farms themselves to existing regulations on safety and health of workers, and to distinguish areas that need immediate attention from the one that may be considered satisfactory. The adjustment to these regulations is generally unsatisfactory, all farms have obtained high absolute scores in the compilation of checklists. Indeed, taking as maximum acceptable two major defaults, the results reported express a general situation of serious inadequacy. It is clear, then, the widespread non-compliance to existing regulations on health and safety of workers, although most farms have the characteristics for being subjected to the rules contained in Italian legislative Decree n. 626/94.

The buildings situation is critical, probably because too few checks have been carried out in order to led employers to achieve the necessary adjustment. The latter, moreover, are very expensive and farmers are not encouraged to come to them also in view of the lower frequency of serious accidents that occur inside buildings compared to those caused by improper use of agricultural machineries. It follows, therefore, the urgent need for a targeted training of employers and workers to enable them to gain awareness of the problem of safety and to understand the importance of specific interventions. Institutional authorities and trade associations must be involved to act in a capillary way in the territory, creating opportunities of meeting and confrontation among workers aimed at encouraging the culture of prevention and safety. The objective can not be simply to obtain the rules compliance of the rules by the farms, but must be to achieve especially awareness of the problem of all those involved in the production process.

Finally, the situation analyzed is representative of farms that have at least one employee. On the Hyblean Plateau, however, there are many family farms without employees, and therefore not subject to the requirements set by the Italian legislative Decree n. 626/94. That fact, however, must not promote working conditions that do not guarantee minimum safety requirements. It becomes necessary, then, to remove the conviction, unfortunately very widespread, that the safety and health of workers are simply a legal obligation and it is necessary to plan activities to spread the general awareness of the problem even among those

who will be never checked but who have as well the duty to ensure an environment of work appropriate even only for himself.

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