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EVALUATION OF THE MICROBIAL ENVIRONMENT OF RABBIT CAGES WITH AND WITHOUT ENRICHMENT STRATEGIES

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INTRODUCTION

There is a tight correlation between animal and human health, welfare and animal production; in fact the presence of a high microbial charge in the environment could compromise both the animal welfare and the human health. Among fungi, dermathophytes are much important in rabbit farms because they spread easily and quickly from animal to animal and they are zoonosic agents for workers.

So it's necessary to explore the presence of bacteria (e.g. *Salmonella, Escherichia coli EHEC, Staphylococcus aureus, Pasteurellaceae*), viruses, fungi (environmental and dermathophytes) and parasites.

OBJECTIVE

Aim of this work is the evaluation of the environmental charge of microorganisms, bacteria and fungi, in a rabbit farm.

MATERIAL AND METHODS

The trial was run in a intensive rabbit farm located at the North-West of Italy (Lombardia region). During the trial the room temperature was about 15°C and the daily lighting was 16 hours. Animals (hybrid rabbits) were fed a commercial diet. Feed and water were available *ad libitum*.

The total bacterial and fungal charge in rabbit nests, in individual cages (12 per treatments – three reproductive cycles) with enrichment (wooden stick or a "plastic" carpet) and in control cages without any environmental enrichment was investigated during wintertime. For air sampling the SAS System® (PBI® International, Italy) (Fig. 4) with plates filled with *Tryptic Soy Agar* for

bacteria, *Sabouraud Dextrose Agar* for moulds and *Dermasel Agar* for dermathophytes was used. All the media were provided by Oxoid®, Italy.

The results were expressed as CFU (Colony Forming Units)/m3 for air sampling and in percentage for the isolation rate of micro-organisms.

1) AIR SAMPLING OF NESTS AND ENVIRONMENT

In nests and in environment it was found that the bacterial charge was between 50-100 CFU/m3 and the fungal charge was <50 CFU/m3.

2) EVALUATION OF THE MICROORGANISMS IN THE DIFFERENT KIND OF CAGES

Control cages		**Cages with wooden stick**		**Cages with a plastic "carpet"**	
Microorganisms	**%**	**Microorganisms**	**%**	**Microorganisms**	**%**
Bacillus	**100**	*Bacillus*	**100**	*Bacillus*	**100**
Alternaria	**8.3**	*Alternaria*	**8.3**	*Alternaria*	**8.3**
Aspergillus Niger	**41.7**	*Aspergillus Niger*	**8.3**	*Aspergillus Niger*	**50**
Microsporum Gypseum	**50**	*Microsporum Gypseum*	**58.3**	*Microsporum Gypseum*	**41.7**

DISCUSSION

- The value of the total bacterial charge was low and the fungal one was very low (see part 1 of Results) with regards to the environmental risk according to the parameters supplied by the SAS System's producer.
- *Bacillus* represents a genus of Gram-positive bacteria which are ubiquitous in nature (soil, water and airborne dust); spores of *Alternaria* (fig. 1) specie are dispersed by air currents and are usually a major component of outdoor air. So these microorganisms could be considered as normal flora in the environment.
- *Aspergillus niger* is a common contaminant of food and is less likely to cause disease than some other *Aspergillus* species (fig. 2), but if large amounts of the spores are inhaled, severe aspergillosis can occur (see part 2 of Results).
- The isolation of the geophilic fungus *M. gypseum*, (fig. 3) both in nests and in the environment, suggests that the coat of these rabbits would be colonised by this widespread dermathophyte (see part 2 of Results).

CONCLUSION

- This method for the evaluation of the microbiological impact on animal welfare is reliable, simple, rapid and not expensive.

- These preliminary results show that there is no zoonosic risk for worker's health.

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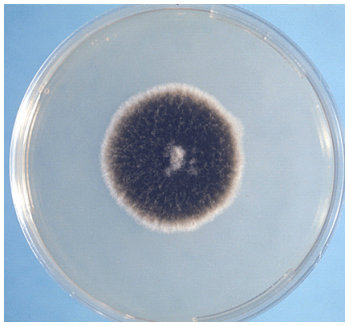

Figure 1. Environmental fungi (*Alternaria* spp.)

Figure 2. Environmental fungi (*Aspergillus niger*)

Figure 3. Dermatophyte (*Microsporum gypseum*)