Italian Journal of Animal Science

ISSN: (Print) 1828-051X (Online) Journal homepage: https://www.tandfonline.com/loi/tjas20

Fungal environment in different rabbit intensive farms

P. A. Martino, F. Luzi & M. Verga

To cite this article: P. A. Martino, F. Luzi & M. Verga (2007) Fungal environment in different rabbit intensive farms, Italian Journal of Animal Science, 6:sup1, 774-776, DOI: 10.4081/ijas.2007.1s.774

To link to this article: https://doi.org/10.4081/ijas.2007.1s.774

Fungal environment in different rabbit intensive farms

P. A. Martino[1], F. Luzi[2], M. Verga[2]

[1] Dipartimento di Patologia Animale, Igiene e Sanità Pubblica Veterinaria. Università di Milano, Italy
[2] Istituto di Zootecnica. Università di Milano

Corresponding author: Piera Anna Martino. Dipartimento di Patologia Animale, Igiene e Sanità Pubblica Veterinaria. Università di Milano. Via Celoria 10, 20133 Milano, Italy - Tel. +39 02 50318083 - Fax: +39 02 50318089 - Email: piera.martino@unimi.iy

ABSTRACT - Many environmental factors (for example, temperature, relative humidity, ventilation, NH_3 concentration) can influence the health and welfare of rabbits reared in intensive farms. Among these elements, microorganisms and, in particular, fungi play a pivotal role in the spreading of potential pathogenic and zoonotic diseases. Aim of our work was to evaluate the fungal contamination in two different rabbit rearing (A and B). SAS System® (PBI International, Italy) and opened plates, filled with cultural media for fungal growth (environmental and dermatophytes) have been used. The data collected in both the farms showed that, for environmental fungi, *Aspergillus*, *Alternaria* and *Penicillium* were the most spread. On the contrary, for dermatophytes, there was a difference between farm A and B. In fact, in the first one *Microsporum canis* (a known zoonotic agent) has been recovered in high concentration, while in the second rearing we have isolated *Microsporum gypseum* a geophilic fungus with a very low pathogenic potential.

Key words: Rabbitries, Fungal environment, Health, Zoonotic risk.

INTRODUCTION - There is a tight correlation between the environmental quality of the rearing and the healthy status and subsequently welfare of the animals. This is also true for rabbits in relation to the fungal environmental spreading, that is depending on many factors such as relative humidity (>70%), temperature (>25°C), overcrowding in cages. Particularly, among fungi, it's important to consider the activity of the typical environmental ones, such as *Aspergillus, Penicillium, Alternaria, Cladosporium* (potential pathogens or saprophytic species) that are able to produce a great number of spores that are released in the environment (air, bedding, etc.) and that could cause respiratory diseases. However, the presence of dermatophytes in the rabbit rearing (i.e., *Microsporum* spp., *Trichophyton* spp.) is much important.

After rabbit farming was industrialized the incidence of dermatomycosis drastically increased. The perturbation of cutaneous homeostasis, the lack of crude fiber in the diet and the age of animals are very important factors that can contribute to the growing of dermatophytes. The infection spread rapidly resulting in poor conditions of the young rabbits with high morbidity and economic losses. Moreover, the infected animals present a permanent source of zoonotic infections for the attendants.

Aim of this work is the evaluation of the different fungal environmental in two rabbit rearing with different management of animals (number for cages and air ventilation).

MATERIAL AND METHODS - The trials have been performed at two different meat rabbit farms. The first rabbit rearing (A) was located in the province of Alessandria (Piemonte region). Rabbits (New Zealand and California breeds) are located in two separated sheds with mixed ventilation (natural and forced), one assigned to the reproductive sector and one to the fattening sector, in open-air system (8 animals per cage).

The second farm (B) was located in the province of Bergamo (Lombardia region) and the rabbits (New Zealand hybrids) are located in two different rooms of the same building, with forced ventilation, one for does and nests and one for fatteners. The evaluation of the fungal environment was performed using two methods; for nests we have used the SAS System® (PBI International, Italy), that filters a known volume of air that is placed directly on Petri

plates filled with cultural media for fungi (*Sabouraud Dextrose* Agar and *Dermasel Agar*) (Oxoid, Italy). For does and fattening shed we have used "opened Petri plates", filled with the above mentioned fungal cultural media; these plates were exposed for 10 minutes. Then, all the samples have been incubated at 25°C for 72h (environmental fungal count) and 5-7 days for dermatophytes.

The fungal identification has been performed with the macroscopic and microscopic evaluation of the characteristics of the colonies (pigmentation; dry or cottony aspect; *macroconidia* and *microconidia*).

RESULTS AND CONCLUSIONS - In Table 1 are reported the results obtained in reproduction and fattening sheds of farm A. *Aspergillus, Alternaria* and *Penicillium*, alone or in association with other fungi, were the most spread among environmental *fungi*. As regards dermatophytes, it's important to underline the high presence, in this rabbit rearing, of *Microsporum canis* in both types of sheds while *Trichophyton mentagrophytes* is present in a low percentage. Moreover, many animals showed various lesions on the skin referable to dermatophytes infection with a high risk of transmission to attendants of this zoonotic disease.

Table 2 shows the data collected at the farm B; in both the animal rooms *Alternaria, Cladosporium, Aspergillus niger* and *Microsporum gypseum* have been isolated. In the fattening shed was recovered the presence of *T. mentagrophytes*, even if in low percentage (8.3%).

The data show that the environmental fungi (such as *Alternaria, Aspergillus*) are ubiquitous in both kind of rabbit rearing with an unavoidable exposure of the animals but without signs of disease. As regards dermatophytes, in the breeding A we suppose that the presence of *M. canis* could be due to poor hygiene during human manipulation of rabbit and to the presence of dogs circulating in the shed, too. Moreover the presence of *T. mentagrophytes* in the reproduction shed could be due to the presence of "healthy carriers" does and to the high concentration of animals (8) in the cages.

Table 1. Fungi isolated at the rabbit rearing A.

Rabbit rearing A			
Reproduction shed		Fattening shed	
Fungi	% of positive samples	Fungi	% of positive samples
Mucorales	29.86	Mucorales	12.50
Alternaria	27.55	Alternaria	52.50
Aspergillus	20.45	Aspergillus	12.50
Penicillium	9.65	Penicillium	3.75
Microsporum canis*	33.74	Microsporum canis*	51.25
Trichophyton mentagrophytes*	6.41	Trichophyton mentagrophytes*	2.50

**Dermatophytes*

Table 2. Fungi isolated at the rabbit rearing B.

Rabbit rearing B			
Reproduction shed		Fattening shed	
Fungi	% of positive samples	Fungi	% of positive samples
Aspergillus niger	36.12	Alternaria	75.00
Alternaria	11.09		
Microsporum gypseum*	41.67	Microsporum gypseum*	8.30
		Trichophyton mentagrophytes*	8.30

**Dermatophytes*

On the contrary in the farm B, we have isolated above all *M. gypseum*, a geophilic fungus with a pathogenic potential less than *M. canis* and *T. mentagrophytes*. Furthermore, we have found a fungal environment in a very low percentage and without lesions on the rabbit's body.

At the end, the result of the comparison of these two kind of intensive rabbit rearing allows to underline how the evaluation of the microbiological quality of the air could be a valid aid for the evaluation of the animal health status and the zoonotic risk that the workers are subject to.

The research was supported by COFIN 2005 funds.

REFERENCES - **Jacchia**, G., Martino, P.A., 2000. Il rischio biologico da dermatofitosi. Rivista di Coniglicoltura 3:57-63. **Luzi**, F., Martino, P.A., Verga, M., 2005. Behaviour and production of fattening rabbits in colony cages, with and without environmental enrichment. J. of the Hellenic Vet. Med. Soc. 56(4):301-306. **Martino**, P.A., Jacchia, G., Cocilovo, A., 1998. Prevalenza delle dermatofitosi in conigli con lesioni cutanee, utilizzati per fini scientifici. Atti LII Conv. Naz. SISVet, pp. 159-160. **Martino**, P.A., Luzi, F., Verga, M., 2005. Microbiological control of the environment in an intensive rabbit rearing. Proceedings of the 8. World Rabbit Congress, WRSA, Universidad Politécnica de Valencia, p. 576-581. **Pitt**, J.I., 1994. The current role of *Aspergillus* and *Penicillium* in human and animal health. J. Med. And Vet. Micology 32(S1):17-32. **Rosell**, J.M., Paya, J., Ramos, C., 1985. Dermatofitosis del conejo domestico ensayos clinicos con eniconazole. Proc. 10th Symp. Of the Ass. Espanola de cunicultura, Barcelona, Spain, pp. 167-178. **Van Cutsen**, J., Rochette, F., 1991. Mycoses in domestic animals. Vol. 226, Janssen Reasearch Foundation, Beerse, Belgium. **Vangeel**, I., Pasmans, F., Vanrobaeys, M., De Herdt, P., Haesebrouck, F., 2000. Prevalence of dermatophytes in asymptomatic guinea pigs and rabbits. The Vet. Rec. 8:440-441. **Zaror**, L., Casas, S., 1988. *Microsporum canis* in conejos angora sanos (Valdivia-Chile). J. Vet. Med. B 35:204-206.