

PREVALENCE OF PATHOLOGICAL LESIONS IN MEAT RABBITS AT SLAUGHTERING

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ABSTRACT

The slaughterhouse is considered an important control point for the monitoring of rabbit diseases. In our study, 59,440 rabbit carcasses were examined, but only 1% of pathological lesions were recorded at *post-mortem* inspection. Mainly tegumentary, digestive and urinary systems were affected. The most consistent lesion was the subcutaneous abscess; nephritis, probably caused by *Encephalitozoon cuniculi*, was also frequent. A pathological alteration of the liver, classified as “necrotizing hepatitis”, localized at the caudate lobe, was observed and here firstly described.

Key words: Rabbit, Pathology, Slaughterhouse, *Post-mortem* examination, Epidemiology.

INTRODUCTION

The slaughterhouse, and its regulations, represents a key control point of livestock production chain (Facchin *et al.*, 2003). Any observation and information obtained at slaughterhouse can contribute to the understanding of slaughtered animals' diseases. The pathological examination represents an useful tool to make a diagnosis within the slaughter line. In this context, it should be emphasized the noteworthiness of hygienic and sanitary control of rabbit meat slaughtering, since the growing interest of consumers to this meat and the high production level recently reached in our country (Di Sarno, 1994).

Records of *ante-* and *post-mortem* inspection allows to collect epidemiological data useful for the evaluation of diseases at farm level and to verify the efficacy of prophylactic and therapeutic interventions (Cortesi, 1993). Unfortunately, very few papers are published on this field. According to this “epidemiological” role of rabbit slaughterhouse, the aim of this survey was to check the type and prevalence of pathological lesions in slaughtered rabbits and to verify if the evaluation of the health status of farmed rabbits at slaughtering could reflect and be likely indicative of disease problems at the farm level.

MATERIALS AND METHODS

The study was performed in a slaughterhouse located in the province of Padua (Veneto Region), which processed meat rabbits from industrial farms of different Regions of Northern Italy. The plant had a slaughter capacity of 2,000 rabbits/hour with a speed of 34 rabbits/minute. Animals were usually 80 to 95 days old and about 2% of animals was represented by culled does. For the detection of pathological lesions, 59,440 rabbit carcasses (of which 944 does) were examined at the carcass evisceration point along slaughtering line. To our aim, any abnormality of integument, digestive, urogenital, respiratory and musculoskeletal systems was recorded. Samples of pathological tissues were collected for histological examination, carried out according to standard techniques. Skin lesions, such as

dermatomycoses, mange or sore hocks could not be evaluated, since carcasses were already skinned and just eviscerated at observation point. For the same reason, it was not possible to differentiate lesions of meat rabbits from those of culled does.

RESULTS AND DISCUSSION

Data concerning slaughtered rabbits are reported in Table 1; the average body weight was 2.614±0.207 kg. Only 610 (1%) out of 59,440 carcasses examined showed pathological lesions. In total, 1,114 carcasses (1.9%) were not licensed for human consumption.

Table 1: Data regarding slaughtered rabbits

Farm*	Meat rabbits (n)	Culled does (n)	Average body weight (kg)	N of condemned rabbits (%)	Rabbits dead during transport	Rabbits with lesions
A	30	30	-	8 (26.7)	4	4
B	4,548	0	2.264	117 (2.6)	9	54
C	2,005	69	2.633	77 (3.8)	3	26
D	1,622	70	2.478	101 (6.2)	0	28
E	2,546	13	2.553	28 (1.1)	19	12
F	2,451	25	2.664	34 (1.4)	8	7
G	651	0	2.565	1 (0.2)	2	7
H	3,061	71	2.625	37 (1.2)	0	16
I	3,295	60	2.451	18 (0.5)	5	19
J	1,363	26	2.702	16 (1.2)	0	16
K	3,024	340	2.794	65 (2.1)	4	45
L	2,941	0	3.098	41 (1.4)	13	43
M	280	6	2.692	27 (9.6)	2	39
N	2,788	18	2.583	66 (2.4)	8	29
O	3,687	0	2.555	33 (0.9)	16	22
P	1,516	0	2.876	11 (0.7)	1	12
Q	2,525	5	2.513	16 (0.6)	7	26
R	3,105	0	2.232	66 (2.1)	0	11
S	542	0	2.343	29 (5.4)	0	9
T	1,386	0	2.554	12 (0.9)	2	18
U	681	80	2.695	27 (4.0)	4	9
V	2,603	30	2.779	8 (0.3)	8	11
W	683	15	3.101	20 (2.9)	1	20
X	718		2.465	19 (2.6)	2	5
Y	6,260	30	2.656	115 (1.8)	6	56
Z	1,029	20	2.643	22 (2.1)	0	7
AB	1,157	0	2.390	19 (1.6)	0	5
CD	2,943	36	2.684	111 (3.8)	10	54
TOTAL	59,440	944	2.614	1,144 (1.9)	134	610

* To capital letters correspond a group of rabbits from the same farm, but slaughtered in different days

The lesions found are reported in details in Table 2. The most frequent pathological lesion of tegument was the *abscess*, single or multiple, with various localization and size. Respiratory system was not affected by a high prevalence of lesions. Briefly, these have been classified into two major categories: a) *lung abscesses*, often involving only one lung; b) *pneumonia* and *pleuropneumonia*, characterized mainly by fibrinous inflammation.

With regard to the digestive system, *enteritis* varying from severe congestion to petechial hemorrhages was detected; only in one case *tiphilitis* was present, thus showing a very low prevalence. Lesions in the liver consisted in degeneration, such as *steatosis*, or inflammation, mainly *chronic hepatitis*, such as hepatic abscesses, or disseminated miliary *necrosis*. Other liver changes were represented by hepatomegaly with irregular surface and necrotic foci in the parenchyma. Parasitic infections of the liver were also detected: *cysticercosis* was occasionally present, while *hepatic coccidiosis* was more frequent. A not previously reported lesion of the liver was also observed. Because of a typical progression from an inflammatory picture to a complete necrosis, we called this alteration “*necrotizing hepatitis*”; the pathological change was always localized at the papillary process of the caudate lobe. The histopathology confirmed gross lesions observed at *post-mortem* inspection.

Regarding the reproductive system, the most frequent finding was *pyometra*. *Metritis* and *metropathy with foetal retention* were also observed at *post-mortem* inspection of does. *Chronic nephritis* was the main lesion localized at the urinary system; in many cases both the kidneys were affected. Grossly, firm whitish fibrotic foci were seen. In other cases, small and diffuse fibrotic retraction was present on the kidney surface. Microscopic examination showed cortical fibrosis with multifocal areas of mineralization, sometimes involving the entire thickness of the cortical. *Encephalitozoon cunicoli* was found in such lesions.

Finally, it is opportune to underline that some lesions were probably underestimated, due to the peculiar observation point along the slaughtering line.

Table 2: Pathological lesions detected in slaughtered rabbits

Lesions	N of cases	% on slaughtered rabbits	% on recorded lesions
Integument			
Subcutaneous abscesses	230	0.387	37.70
Respiratory system			
Lung abscesses	11	0.019	1.80
Pneumonia	17	0.029	2.79
Digestive system			
Enteritis	26	0.044	4.26
Typhlitis	1	0.002	0.16
Hepatitis	12	0.020	1.97
Hepatic degeneration	11	0.019	1.80
Steatosis	39	0.066	6.39
Liver necrosis	25	0.042	4.10
Necrotizing hepatitis	27	0.045	4.43
Perihepatitis	2	0.003	0.33
Hepatic coccidiosis	48	0.081	7.87
Cysticercosis	2	0.003	0.33
Peritoneal cysts	2	0.003	0.33
Hepatic cysts	1	0.002	0.16
Reproductive system			
Pyometra	40	0.067	6.56
Metritis	16	0.027	2.62
Metropathy with foetus retention	3	0.005	0.49
Urinary system			
Chronic nephritis	96	0.162	15.74
Kidney cysts	1	0.002	0.16
TOTAL	610	1.03	

The prevalence of pathological lesions detected in this study was about 1%, a very low percentage on the total number of examined rabbits. This finding could probably mean that the health status of slaughtered rabbits was satisfactory. Moreover, it could be noted that tegumentary diseases, particularly abscesses, were of great significance for the health status of rabbits, followed by digestive disorders. Comparing our findings with similar studies performed about 20 years ago (Albiero, 1988; Ferrari *et al.*, 1989; Julini, 1993), a difference in the percentage of pathological lesions detected at rabbit slaughtering can be noted (0,5% vs. 1%). This finding could rise from numerous factors, many of which are difficult to identify (i.e. origin of rabbits, hygienic-sanitary condition of farms, etc.), but it could also result from changes of housing and management systems in rabbit farming, particularly the high densities reached under intensive conditions. This hypothesis is supported by the high prevalence of subcutaneous abscesses detected in our study. In fact, this pathological condition is usually caused by predisposing factors related to environmental conditions of the farm. In contrast, the very low level or the absence of other pathologies, such as parasitic gastroenteric diseases or nutritional disorders (i.e. myodystrophy and myopathy) respectively, may emphasize a better control of such diseases in the modern rabbit farming.

An interesting finding is the clear decline of respiratory diseases, whereas enteric disorders seem increasing. The latter occur mainly in growing rabbits and are characterized by multifactorial

aetiology, such as pathogenic bacteria, imbalanced diets or incorrect use of antibiotics (Grilli *et al.*, 2006).

It is also interesting to note an increase of cases of nephritis. This pathological condition could be caused by multiple factors, such as drugs, toxins, metabolic stress and parasites. In our study, since *Encephalitozoon cuniculi* was found in most samples, it could be hypothesized a wide spread of the infection, probably due to the modern type of industrial farming (i.e. high densities of animals, multi-age farming, closed cycles, hygienic conditions, etc.).

During this study, we detected a pathological alteration of the liver, defined “*necrotizing hepatitis*”, affecting always the papillary process of the caudate lobe. Since no scientific literature concerning this pathological condition is available at present, it has been hypothesized that a new genetic strain, characterized by an anatomical change of caudate lobe vascularization, has been commercialized in rabbit farming. Further investigation is needed to understand the aetiopathogenesis of this alteration.

CONCLUSIONS

In conclusion, the health status of slaughtered rabbits can be considered satisfactory; tegumentary lesions continue to represent common diseases of farmed rabbits, even if enteric disorders seem increasingly becoming more significant. From our findings, it is noteworthy to underline that most of the pathological lesions observed at slaughtering are the outcome of chronic diseases; whereas acute diseases, often causing significant economic losses in the modern rabbit farming, might go undetected. Consequently, it is evident that information collected at slaughterhouse could not give a complete picture of disease problems at farm level. In contrast, it is comprehensible that detecting chronic diseases at the slaughterhouse, even if at low prevalence, could mean an exponentially more severe problem at the farm. Thus, it could be hypothesized that the selection of rabbits during the growing period and at loading for abattoir could determine an underestimation of diseases occurring at the farm, particularly acute diseases. It could also be hypothesized that morbidity could be low at the farm, but this is clearly in contrast with the recent scientific literature (EFSA, 2005). Recently, commercial rabbit farming has been considerably industrialized, but domestic rabbit can easily suffer stress because it is still not completely adapted to the intensive husbandry and management systems. For this reason, diseases might cause devastating effects with high mortality rates at farm and consequently lack of detection during slaughtering process. Nevertheless, the slaughterhouse seems to play a good “epidemiological” role for chronic diseases, but it does not allow to obtain a comprehensive picture of rabbit diseases.

REFERENCES

- Albiero L. 1988. Controllo igienico sanitario degli impianti di macellazione e cause di eliminazione della carcassa. *Ing. Alim.*, 6, 27-45.
- Cortesi M.L. 1993. Filiera cunicola. *Riv. Coniglicoltura*, 30, 21-26.
- Di Sarno C. 1994. Il macello come osservatorio epidemiologico. *Riv. Coniglicoltura*, 31, 16-21.
- EFSA 2005. The impact of the current housing and husbandry systems on the health and welfare of farmed domestic rabbits. *Annex to the EFSA Journal.*, 267, 1-31.
- Facchin E., D’Accordi M., Madinelli R., Kiprianidis V. 2003. Il macello, punto chiave della filiera. *Riv. Coniglicoltura*, 31, 11-15.
- Ferrari P., Venturi L., Rosmini R. 1989. Principali lesioni anatomopatologiche riscontrate all’ispezione sanitaria del coniglio. *Riv. Coniglicoltura*, 4, 37-41.
- Grilli G., Ferrazzi V., Agnoletti F., Piccirillo A., Pisoni A.M., Gallazzi D. 2006. La patologia enterica nel coniglio da carne allevato in Italia. *Riv. Zoot. Vet.*, 34, 51-56.
- Julini M. 1993. Aspetti attuali della macellazione del coniglio in Piemonte. *Riv. Coniglicoltura*, 9, 35.