RCASS AND MEAT QUALITY OF FALLOW DEER

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MARY : Carcass value, dressing percentage of meat, and lean meat cuts share /hind legs, shoulder, saddle/ were mpared in 25 male fallow deers /Damma dama/ raised on farm. They were killed in 3 various age categories /10-11, 15-22-23 months/. The animals grazed in the meadows of the farm during the whole year, and got hay and limited amount folder beet and concentrates during the winter period. The animals at the age of 15-17 months had the best dressing entage of meat / 59.0 %/, and the highest lean meat cuts share was with animals at the age of 10-11 months / 76.9 %/. e animals killed / shot dead on farm/ after the winter period /10-11 and 22-23 months old/ had significantly less kidney /0.08 - 0.17 %/ and less surface fat on the carcass, too.

ther on the meat quality in 34 male fallow deers raised on farm, killed at the age of 15-17 months was compared with 15 low deers shot dead in free nature. Samples were taken from m.longissimus dorsi. Fallow deers raised on farm had gher content of intramuscular fat /1.30 % /, less proteins /22.93 %/, less cholesterol /0.69 mg.g $^{-1}$/, and higher content of observed mineral mathers /Fe, P, Ca, K, Na, and Mg/. Their meat was more pale with lower content of loose water 0.49 %/, and with lower cooking losses / 41.43 %/. It was more soft and of less marked aroma after cooking and baking. noticed the meat of DFD character not in a single one animal in both compared groups / pHu 6.2/.

RODUCTION : There is a great tradition in venison export in Slovakia, the territory of which is covered by two thirds h mountains and forests. Hoofed game takes decisive part in it. New possibilities of raising of these animals are created pecialised farms which belong to animal production. Experience from other states show /REINKEN, 1984 ; ASHER, 985/ that fallow deer /Dama dama/ is the most suitable animal for such type of raising in lower altitudes. The main task such new farms is production of fresch choice meat from young animals also out of hunting season. There is a great terest in such farms for the part of breeders. The research is aimed at elaboration of optimum model of farms and checks e meat efficiency of farm animals from various aspects.

e aim was to compare the slaughter value in farm animals of various age categories as will as to compare the meat quality animals from farms and from free ranging animals in this work.

ATERIAL AND METHODS : We compared the carcass value slaughter yields of the carcass and of its individual parts in ale fallow deer, in three age categories /at the age of 10-11/n= 7/, 15-17 /n=11/, and 22-23 /n=7/ months/. We took the imals from the Agricultural Enterprise /AE/ Neverice which has approx. 150 ha at its disposal, on the altitude of 250-300 above SL. The animals grazed in the meadows during the whole year, and got meadowhay ad libitum, limited amount of lder beet and concentrates during the winter period. Besides they had rock-salt at their disposal all the time. The animals ere shot dead with a rifle with a hit into the neck under the head on the farm. /We weighed them/ /Immediately after ey were shot/ (so called live weight), they were hanged disembowelled and skinned. The carcass was cooled at the mperature 1 to 4°C for 24 h and then it was dissected into hing legs, saddle, shoulder /so called lean meat cuts:, and into ck, side with bone, and flank. Their percentual representation in carcass was calculated on the basis of weight.

e kidney fat was weighted and its percentual share in live weight was calculated to evaluate the fat covering of carcass. e evaluated the meat quality in fallow deer from farm and in free ranging ones in the second trial. The farm animals were om the farm AE Sedmihorky with the area of 26 ha, on the altitude 360 m above SL. We evaluated 34 males at the age of 5-17 months, shot dead on the farm. The average weight of animals before killing was 48.0 kg. The comparison group of e ranging animals consisted of 15 males with average weight of 45.5 kg. The animals were from various hunting grounds, t with every individual was known the day, place and hour when it was shot dead. Meat samples for laboratory analyses ere taken from musculus longissimus dorsi behind the last rib in both groups. We determined the basic chemical mposition and nutritional value of meat, and evaluated its physical, technological, and sensorial properties in the mples.

asic statistical characteristic and testing of differences between the groups were realised by means of the personal mputer Commodore COLT.

RESULTS AND DISCUSSION : Trial No 1 Results on carcass value, dressing percentage, and share of the individual parts of carcass according to observed weight categories are given in table 1. Data collection during various seasons / spring, autumn/ is dow in order to check the possibilities of supply of fallow deer meat also out of the main season.

We observed the average live weight before slaughter 25.04 kg in the age category 10-11 months, 42.40 kg at the age of 15-17 months, and 42.81 kg at the age of 22-23 months. We observed mostly lower weights than other authors give for the individual categories. GAEDE /1989/ noticed e.g. the live weight 54.3 kg in 15-17 months old fallow deers, ASHER /1985/ noticed 49.8 kg, and REINKEN /1990/ noticed 50.9 kg. BARTOS et al. /1989/ noticed the average weight 47.6 kg on the farm AE Sedmihorky in the conditions of the Czech Republik. We did not find results for comparison for the category 10-11 months old animals in professional literature. It is possible to compare the category 22-23 months old fallow deers with the category of 25 months old animals in works of authors as follows : FENNESY and DREW /1988/ give the average weight 63.0 kg, and GREGSON and PURCHAS /1985/ give 60.0 kg. These results are from New Zealand farms. Weight of animals after the winter period was on average the same as before. From the viewpoint of purchase with profit is important not only the weight of animals before slaughter but also the carcass weight and the slaughter yield as well as the lean cuts/hind legs, shoulder, saddle/. The animals at the age of 15-17 months had the highest dressing percentage of 59.0 %, It corresponds with hithertio data. GAEDE /1989/ gives the dressing percentage of 58.1 %, SCHWARK et al. /1990/ 55.5 %, ASHER /1985/ 59.9 %, and MULLEY /1988/ and REINKEN /1990/ even about 61 %.

Our results can be evaluated as good in comparison with the mentioned authors.

The lean meat cuts are of great importance for the meat producer, too, because they represent the decisive part of taking in case they are sold singly. It is interesting that the most lean meat cuts /76.95 %/ were in animals at the age of 10-11 months and there was also the highest share of hind legs /43.17 %/ in them. REINKEN /1990/ found the same trend. FENNESY and DREW /1988/ give better dressing percentage of hind legs in lower weight categories, too.

Weight and share of kidney fat which indicate the total overfatness of carcass were significantly higher in animals killed in autumn/category of 15-17 months/ than in animals killed after winter / categories of 10-11 and 22-23 months old animals/. Poor surface covering with fat mainly in the part of back and loins corresponded with that fact in subjective visual evaluation.

Tab.1

Carcass value and dressing percentage in various age categories

		Age in months		
		10-11 n=7	15-17 n=11	22-23 n=7
Live weight = after slaughter	kg	25.04	42.40	42.81
Slaughter weight after cooling	kg	13.54	24.99	25.15
Dressing percentage	%	53.95	59.07	58.76
Kidney fat	kg	0.05	0.20	0.03
	%	0.17	0.48	0.08
Saddle /a/	kg	2.28	4.50	4.32
	%	16.73	18.63	17.16
Hind legs /b/	kg	5.84	10.15	10.41
	%	43.17	40.62	41.39
Shoulder /c/	kg	2.30	4.18	4.29
	%	16.99	16.72	17.07
Neck	kg	1.29	2.11	2.29
	%	9.59	8.42	9.10
Side with bone	kg	1.38	2.85	2.70
	%	10.18	11.35	10.75
Side without bone /flank/	kg	0.48	0.94	0.88
	%	3.54	3.77	3.50
Lean meat cuts /a+b+c/	kg	10.42	18.83	19.02
	%	76.95	75.35	76.05

Detailed results of chemical composition and nutritional value of meat of free ranging animals and of farm animals are given in Table 2. Animals kept on farm had higher content of intramuscular fat /1.30 %/, less proteins /22.93 %, higher share of connective tissue proteins compared with the total oues /1.19 %/, and less cholesterol /0.69 mg/g/ in meat. For comparison's sake SCHWARK et al. /1990/ noticed the fat content from 1.1 to 1.5 %, and content of proteins about 23 % in fallow deer from farm and in free ranging oues. FREUDENREICH and FISCHER /1989/ noticed 0.5 - 0.6 % fat in free meat in fallow deer from farmy i.e. less fat that in our trial.

As far as studied mineral matters are concerned /Table 3/ we found higher values in fallow deer from farm.

The meat of free ranging animals, i.e. of fallow deer, too, offers broad culinary utilisation, and it is also used in production of special meat products /BRITTIN, 1981/. For that reason it is necessary to know also the physical and technological properties of venison, and as the case may be the occurrence of meat defects of DFD character which can occur not only in farm animals but also in free ranging animals according to FREUDENREICH and FISCHER /1989/, and KREUZER and KREUZER /1988/.

It is obvious from results in Table 4 that there was no difference between the groups in final pH value although the meat from the farm fallow deer has a trend to higher values /5.71/. In contrast to other authors /SCHWARK et al., 1990/ we detected not a single animal with DFD meat /pHu 6.2/ in both groups.

We did not notice significant difference in the colour of meat /% of remission/ either. Subjective evaluation of the colour showed that the meat of farm fallow deer is more pale, and it proves the lower average value /3.88/. SCHWARK et al. /1990/ noticed darker meat in free ranging animals, too.

Significantly lower content of loose water /27.49 %/ was in meat from farm animals, and we observed also lower cooking losses /41.43 %/ in this group. The difference was insignificant in baking losses.

The consumer is interested not only in the colour of meat but mainly in tenderness ofter cooking or baking which is decisive for the final impression. We noticed lower values of shear force /WB/ in samples of cooked meat of farm fallow deer, i.e. more tender meat. Results of sensorial evaluation of samples showed /Tab.5/ that the meat of fallow deer from farm has a less characteristic aroma. The differences were not significant with other traits. This knowledge is interesting for those consumers who look for venison because of its high dietary value but they do not like its very strong aroma.

Basic chemical composition Tab.2

	A		B	
	$\bar{x}$	s	$\bar{x}$	s
Water %	74.76	0.79	74.16	0.79
Fat %	1.30	0.61	1.02	0.38
Proteins %	22.93	0.72	23.87	0.86
Ash %	1.06	0.05	1.02	0.07
Connective tissue proteins+	1.19	0.45	1.33	0.32
Cholesterol mg/g	0.69	0.16	1.27	0.12

+ share to total proteins
A = fallow deer from farm
B = fallow deer from nature

Content of mineral matters in mg/100g Tab.3

	A		B	
	$\bar{x}$	s	$\bar{x}$	s
Fe	4.76	2.48	1.97	0.75
P	146.62	71.85	137.78	32.96
Ca	17.81	12.57	10.01	2.26
K	312.57	93.04	273.93	49.77
Na	80.63	40.42	58.28	12.07
Mg	46.55	18.63	37.75	16.15

Physical and technological properties Tab.4

	A		B	
	$\bar{x}$	s	$\bar{x}$	s
pHu	5.71	0.13	5.58	0.06
Colour /% of remission/	5.71	0.91	5.83	0.83
Colour /subjectively/	3.88	0.73	4.17	0.82
Content of loose water %	27.49	4.19	32.52	2.12
Cooking losses %	41.43	3.36	44.23	2.42
Baking losses %	42.47	3.60	42.23	5.02
Shear force of cooked meat,kg	4.32	1.38	4.78	2.03
Shear force of baked meat, kg	5.20	2.15	6.07	3.35

Sensorial properties Tab.5

	A		B	
	$\bar{x}$	s	$\bar{x}$	s
Aroma	3.95	0.62	4.17	0.39
Flavour	3.89	0.32	3.92	0.29
Juiciness	3.42	0.51	3.60	0.65
Tenderness	3.75	0.54	3.83	0.83

CONCLUSION : On the basis of the gained results we can state :

1.The fallow deer raised on specialised farms achieves good slaughter yield mainly at the age of 15-17 months.

2.The younger animals at the age of 10-11 months have the greatest part in lean meat cuts.

3. The animals killed after winter have lower content of kidney fat, and smaller amount of surface fat on carcass corresp with this fact.

4. The meat of animals raised on farm has higher content of intramuscular fat less proteins, lower share of connective proteins, less cholesterol, and higher content of mineral matters.

5. It is also more pale, has lower content of loose water, lower cooking losses, and it is more tender and of less intens aroma after cooking or baking.

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