MEAT QUALITY BY KEEPING FALLOW DEER WITHIN AN ENCLOSURE

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Introduction

Fallow deer is specially able to live in keeping animals within an enclosure (10). Germany rank of the second order in the world with 80,000 breeding animals and circa 5,000 enclosures back New Zealand. (5). In Germany it is to be seen more and more, that meat products are made by fallow deer meat (8, 7). Because of this state of affairs it is necessary to know more about the status and the quality of raw material: fallow deer meat. The status and the quality of fallow deer meat are described by chemical-physical parameters too.

Material and methods

40 animals of the university`s own enclosure were performed an examination. The killing of animals were done with administration of a drug by rifle -fired syringe from a high stand. A total of ten muscle one half of a carcase was studied. The following characters of meat were included in that research: pH-value, water holding capacity (WHC) with the help of drop less and filter paper press method, electric conductivity (EC) at one hour and 24 hours post mortem. The pH measurements were made with the pH-meter pH 95 WTW. EC was measured with the NEUKUM conductometer LF 3002. The drip loss was evaluated with the help of method by SCHWÄGELE (11).The filter paper press method was carried out via the rules of VwFlHG (12).

Results and discussion

The population of 40 animals was divided in 5 femal and 17 male animals as well as 17 castrated male and one cryptorchided animal. The live weight runs from 22 to 60 kg. The animals were between 12 and 18 months old. **The pH-value 1 hour p.m.** of the 10 investigated muscles ranges between 5.25 and 7.15. The given values (6) of the pH-value 30 minutes p.m. for the MLD and for the MSM can be confirmed in connection with our early post mortem researches only for the minimum (about 5.4). The differentiation between the muscles is not so strong as for other species of animals, for example the pig (3). **The pH-value 24 hours p.m.** of all muscles in evaluation was between 4.40 and 7.42. This extensive range has its reason in two outliners at MSM and at MM. Apart from the outliners and extreme values as well as the MM the values are between 5.35 (MSM) and 6.86 (MSS). The range is more extensive than in the publication of other autors (1; 4; 2). These autors have above all measured in the MLD and the MSM. The means of other publications (6) for the MLD and the MSM differ from our measurements just about hundredth. The theory of DFD - pH-value higher than 5.8 (12) or PSE - pH-value lower than 5.4, was not acknowledged with sensory evaluation. **The electric conductivity measurements** show a very different description. A lot of outliners and extreme values are noteworthy. **The drip loss 1 hour p.m. respectivly 24 hours p.m.** ranged between 0.5 and 1.5 %. Most of the 1 hour-values exceed one percent, most of the 24-hours-values are under 1 and over 0.5. It is not possible to exploit the MM because the gunshot wound was in the intermandibular region, in the regiones capitis or in the regiones colli. The values by BRÜGGEMANN (2) are confirmed. To both times of measurements with **the filter paper press method** (modify to quotient of meat film area and liquid ring zone with values every under 1) shows a distinct difference but no extreme values between the muscles. It is possible to compare with the values of beef meat (12). The problems are lower with extreme values and outliners than at other methods for WHC of meat.

Conclusions

Ten of the most important muscles of carcase halves of 40 fallow deers were researched according to their meat quality. The results contain pH-value, electric conductivity and water holding capacity. They show that there are definite differences between the muscles. The values which were found out exceed the limits of value for lack of meat quality that can be found in the literature without the existence of sensory results for PSE and DFD.

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TABLE 1: Sample of statistical measures for the investiged characteristics of meat quality

muscle / measures	M. longissimus dorsi		M. semimembranosus		M. semitendinosus		M. biceps femoris		M. rectus femoris		M. gluteus medius		M. psoas major		M. triceps brachii		M. supra spinatus		M. masseter	
0	1		2		3		4		5		6		7		8		9		10	
abbreviation	MLD		MSM		MST		MBF		MRF		MGM		MPM		MTB		MSS		MM	
part of carcase	back		leg of meat		leg of meat		leg of meat		leg of meat		leg of meat		filet		shoulder		shoulder		head	
hours p.m.	**1**	**24**	**1**	**24**	**1**	**24**	**1**	**24**	**1**	**24**	**1**	**24**	**1**	**24**	**1**	**24**	**1**	**24**	**1**	**24**
pH - VALUE																				
mean	6.26	5.74	6.21	5.71	6.07	5.84	6.26	5.82	6.38	5.90	6.20	5.83	6.05	5.84	6.25	5.80	6.37	6.33	6.45	6.54
maximum	7.15	7.13	7.01	6.67	7.00	6.46	7.01	6.81	7.10	6.70	7.02	6.67	6.95	7.03	6.96	6.64	7.07	6.86	7.09	7.42
minimum	5.50	5.44	5.52	4.40	5.47	5.51	5.47	5.48	5.57	5.56	5.56	5.50	5.42	5.51	5.55	5.48	5.53	5.48	5.25	6.20
percentil 25	5.94	5.52	5.89	5.52	5.75	5.60	6.04	5.55	6.08	5.67	5.93	5.55	5.70	5.58	5.94	5.62	6.14	5.75	6.27	6.33
percentil 75	6.55	5.84	6.48	5.94	6.30	6.18	6.58	5.98	6.66	5.99	6.45	6.02	6.34	5.94	6.54	5.85	6.69	6.30	6.75	6.64
ELECTRIC CONDUCTIVITY (mS)																				
mean	2.40	2.86	4.30	3.90	5.04	4.01	4.85	4.10	3.32	3.20	4.30	3.86	4.05	3.29	2.79	3.15	2.06	3.05	3.51	4.45
maximum	6.9	6.2	9.3	8.8	13.7	9.2	14.5	12.4	10.5	6.6	12.4	8.6	11.5	11.5	8.00	5.2	3.10	4.6	8.40	11.0
minimum	0.70	2.0	1.80	2.2	1.50	1.8	1.70	2.0	1.40	2.1	1.00	2.2	1.40	1.7	1.00	2.4	1.00	2.2	1.30	1.8
percentil 25	1.60	1.60	2.60	2.55	2.50	2.45	2.90	2.85	2.10	2.1	2.75	2.72	2.00	1.95	1.95	1.92	1.65	1.62	2.65	2.62
percentil 75	2.45	2.48	5.55	5.68	6.32	6.44	5.15	5.38	4.20	4.45	5.10	5.35	5.55	5.78	3.20	3.35	2.45	2.48	4.32	4.46
DRIP LOSS (%)																				
mean	1.18	0.93	1.41	0.89	1.33	0.89	1.29	0.79	1.31	0.76	1.18	0.75	1.23	0.88	1.09	0.77	1.07	0.89	1.99	1.65
maximum	1.80	1.42	2.33	1.54	3.45	2.30	1.92	1.48	2.06	1.47	1.75	1.51	2.12	2.19	1.59	1.52	1.65	2.30	3.66	4.52
minimum	0.76	0.35	1.10	0.36	0.88	0.39	0.96	0.34	0.80	0.18	0.63	0.23	0.78	0.36	0.62	0.38	0.70	0.26	0.93	0.05
percentil 25	1.02	0.74	1.15	0.68	1.03	0.67	1.15	0.68	1.12	0.65	1.03	0.60	0.96	0.68	0.96	0.57	0.82	0.62	1.16	0.48
percentil 75	1.22	1.15	1.52	1.00	1.39	0.98	1.41	0.88	1.44	0.86	1.28	0.83	1.39	096	1.23	0.85	1.32	0.97	2.45	2.26
QUOTIENT OF MEAT FILM AREA „F" and LIQUID RING ZONE „f" (without unit of measure)																				
mean	0.57	0.71	0.56	0.68	0.49	0.63	0.56	0.70	0.52	0.59	0.55	0.64	0.51	0.61	0.51	0.64	0.49	0.56	0.42	0.47
maximum	1.00	1.00	0.84	0.86	0.83	1.00	0.84	1.00	0.84	0.86	0.86	0.89	0.73	0.73	0.75	0.87	0.83	0.83	0.72	0.73
minimum	0.31	0.51	0.35	0.50	0.27	0.44	0.39	0.51	0.31	0.39	0.31	0.46	0.28	0.46	0.31	0.42	0.28	0.42	0.25	0.27
percentil 25	0.46	0.64	0.42	0.58	0.42	0.51	0.47	0.59	0.44	0.51	0.44	0.55	0.44	0.53	0.37	0.58	0.40	0.46	0.35	0.39
percentil 75	0.62	0.79	0.73	0.75	0.56	0.72	0.60	0.83	0.59	0.70	0.62	0.72	0.59	0.70	0.59	0.70	0.54	0.64	0.44	0.54

FIGURE 1: Description for the distribution of pH-values 24 hours p.m. with help of BOX-AND-WHISKER-PLOT