

## OBSERVATIONS REGARDING THE DURATION OF FEEDING BEHAVIOR WHEN INTENSIVELY FARMED COYPUS (NUTRIAS) ARE FED WITH MAIZE GRAIN AND ALFALFA HAY

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### Abstract

*The studies on coypu behavior are applied in the development of knowledge regarding ethology, in the coypu-breeding technology, animal welfare and, at the moment, they present great importance for animal protection. The biological material studied was consisted of health adult coypus, belonging to the variety Golden Standard with a similar body mass. The indices supervised were: feeding behavior duration if coypus are fed with maize grain and alfalfa hay according to sex and time slot, the duration of one feeding sequence according to forage consumed, sex and time slot and the number of feeding sequences according to forage consumed, sex and time slot. For realising the purposed aim, each coypu was monitored (video), individually, 24 hours a day. The duration of feeding behavior when coypus are fed with maize grain and alfalfa hay was 6.624,88±889,69 seconds for males (7,66% of the behavioral manifestations), and for coypu females, the duration of feeding behavior was 5.656,25±372,13 seconds (6,54% of the behavioral manifestations). The most intense manifestations of the feeding behavior took place in the time slots 14–20<sup>00</sup> and 20–02<sup>00</sup>, and the lowest intensity of the feeding behavior manifestations took place in the time slot 02<sup>00</sup>-08<sup>00</sup>.*

**Key words:** coypu, feeding behavior, intensive system

### INTRODUCTION

Now, few European scientists are especially studying the coypus behavior in order to develop an improved breeding technology for these types of animals, technologies that will lead to increase the coypus production performance.

In Romania, the first researches on the feeding, hygienic and resting behavior of the intensively farmed coypu were carried out by BURA, REBREANU, RADULESCU and TOSCA in 1985.

The studies on coypus behavior are applied in the development of knowledge regarding ethology, in the coypu-breeding technology, animal welfare and, at the moment, they present great importance for animal protection ensuring.

The main purpose of this work is to highlight the main feeding behavior features if intensively farmed adult coypus are fed with maize grain and alfalfa hay.

### MATERIAL AND METHOD

The experiments were performed at the Experimental Didactic Station, Farm 9 "Green Forest", in the rabbits and coypus – breeding sector, within Banat's University of Agricultural Sciences and Veterinary Medicine Timișoara.

Biological material studied consist of healthy adult coypus (*Myocastor coypus*), belonging to the Golden Standard (brown Brunellis) variety, with a similar body mass. The researches has been performed on a total of 16 gentry (8 females and 8 males) in the cold season. Duration of the experiment was 18 days. In the first 2 days, the coypus were accustomed with maize grain and afalfa hay.

Monitoring of biological material was individually (for each stall separately) 24 hours a day, through a video camera. Video recordings took place over a period of 16 days, totaling 384 videotaped hours. The recording of the experimental data obtained was performed with a video camera (Sony

CCD-TRV98E Hi8-VHSPAL) which was placed in the shelter where the experiments were carried out. Video data were stored using a video cassette recorder (Sony - SLV-SE410K-VHSPAL) on videotapes of 16 mm (Maxell - E-180M-VHSPAL). This was possible because the camera was connected via a TV / VCAR when recorded.

The amount of forage given during the experiment was: 150 g maize grain / day / gentry and 150 g alfalfa hay / day / gentry.

To achieve its intended purpose have been used a total of 16 stalls arranged in two rows (8 stalls in a row and 8 stalls on another row) in the first half of the shelter with the number 1.

The maintenance stall have the following characteristics: 1.5 m length, 1.2 m width and 0.95 m height.

Given that climatic factors have a major implication in behavioral manifestations, the microclimate conditions were monitored. Thus, during the experiments was determined, using the equipment for this aim, the following physical parameters of shelter: air temperature, water temperature from water tank, air relative humidity, air streams speed and brightness. Average values of the monitored physical factors (air temperature, water temperature from water tank, air relative humidity, air streams speed and brightness) during the experiments in the experimental shelter are presented in Table 1.

Table 1

Average values for physical factors (microclimate conditions) monitored in the experimental shelter

Season	Physical Factors				
	Air Temperature (°C)	Water Temperature from Water Tank (°C)	Air Relative Humidity (%)	Air Streams Speed (m/s)	Brightness (lx)
Cold	9,00±0,28	8,91±0,14	80,73±0,14	0,074±0,016	172,71±14,68

During the experiment the following indices were monitored:

- the duration of the feeding behavior according to consumed feed, gender and time slot;
- the duration of one feeding according to consumed feed and gender;
- number of feedings according to consumed feed and gender.

## RESULTS AND DISCUSSIONS

The average values and dispersion indices regarding the duration of feeding behavior, if coypus are fed with maize grain and alfalfa hay, in 24 hours are presented in Table 2.

The data presented in the table shows that the average value regarding the total duration of coypu males feeding behavior was 6624.88 ± 889.69 seconds, while for the coypu females, the average value regarding the total feeding behavior duration was 5656.25 ± 372, 13 seconds.

In males, the average value for maize grain consumption in 24 hours was 3518.50 ± 118.27 seconds, and the average value for

alfalfa hay consumption was 3106.38 ± 937.34 seconds.

In females, the average value for maize grain consumption in 24 hours was 3585.75 ± 123.69 seconds, and the average value for alfalfa hay consumption was 2070.50 ± 350.47 seconds.

For coypu males, the duration of feeding behavior in case of feeding with maize grain and alfalfa hay is 7.66% of 24 hours, and for females the duration of feeding behavior represent 6.54% in 24 hours.

Analyzing the feeding behavior duration for intensively farmed coypus, according to consumed forage type, we observed that in coypus male 53.110% of the average total time spent for feeding behavior is allocated for maize grain consumption, and the percentage remaining 46.890% is the percentage duration allocated for alfalfa hay consumption.

For coypus females, 63.394% of the average total time spent for feeding behavior is allocated for maize grain consumption, and the percentage remaining 36.890% is the percentage duration allocated for alfalfa hay consumption.

Table 2

Average values and dispersion indices for feeding behavior duration (seconds) if coypus are fed with maize grain and alfalfa hay in 24 hours

Average and dispersion indices	Males		Females		Total time	
	maize grain	alfalfa hay	maize grain	alfalfa hay	males (maize+hay)	females (maize+hay)
n	8		8		8	8
X	3.518,50	3.106,38	3.585,75	2.070,50	6.624,88	5.656,25
Sx	118,27	937,34	123,69	350,47	889,69	372,13
S	334,71	2652,68	350,04	991,83	2517,82	1053,14
CV	9,51	85,39	9,76	47,90	38,01	18,62
Sx%	3,36	30,17	3,44	16,92	13,42	6,57
Val. min.	3.112	484	3.127	683	4.264	4.069
Val. max.	4.047	8.944	4.049	3.492	12.351	7.440

*n* – numbers of specimens

*x* – mean

*S* – standard deviation

*Sx* – medium mean error;

*CV* – variability coefficient;

*val. min.* – minimum registered value;

*val. max.* – maximum registered value.

In Table 3 are shown average values and dispersion indices regarding the feeding behavior duration (seconds) at different time slots of the day, when coypus are fed with maize grain and alfalfa hay.

In coypu males, in the time slot 08<sup>00</sup>-14<sup>00</sup>, the average total duration for feeding behavior was 1632.50 ± 347.67 seconds, and in females was 1426.38 ± 249.91 seconds.

Analyzing the duration of feeding behavior according to consumed forage type, shows that for coypu males the average duration for maize grain consumption was 1003.38 ± 215.19 seconds, and the average duration for alfalfa hay consumption was 629.13 ± 280.43 seconds.

For coypu females, the duration of feeding behavior according to forage type, in the time slot 08<sup>00</sup>-14<sup>00</sup>, was 1113.38 ± 209.47 seconds for grain maize consumption and for alfalfa hay consumption was 313.00 ± 130.95 seconds.

In the time slot 14<sup>00</sup>-20<sup>00</sup>, the average total duration for feeding behavior for males was 2536.50 ± 448.23 seconds, while for females, the average total duration for feeding behavior was 1979.50 ± 231.32 seconds.

Analyzing the duration of feeding behavior according to consumed forage type in the time slot 14<sup>00</sup>-20<sup>00</sup>, it is noted that the males average duration for grain maize consumption was 1508.38 ± 93.34 seconds

and the average value obtained from alfalfa hay consumption was 1028.13 ± 401.68 seconds.

For coypu females, the average duration obtained for the feeding behavior according to forage type, in the time slot 14<sup>00</sup>-20<sup>00</sup> was 1436.50 ± 110.11 seconds for grain maize consumption and for alfalfa hay consumption the average value obtained was 543.00 ± 148.10 seconds.

Time slot 20<sup>00</sup>-02<sup>00</sup> revealed that the average total duration for feeding behavior for coypu males was 2372.63 ± 430.99 seconds, and for females was 2250.38 ± 317.60 seconds.

Analyzing the duration of feeding behavior according to consumed forage type in the time slot 20<sup>00</sup>-02<sup>00</sup> it is noted that the males average value for maize grain consumption was 955.00 ± 110.62 seconds, and for alfalfa hay consumption the average value obtained was 1417.63 ± 358.61 seconds.

The feeding behavior average duration according to forage type for coypu females, in the above mentioned time slot was 1035.88 ± 180.77 seconds for grain maize consumption and for alfalfa hay consumption the average value obtained was 1214.50 ± 257.58 seconds.

In the time slot 02<sup>00</sup>-08<sup>00</sup> there were manifestations of feeding behavior only for coypu males. Thus the average value

obtained for the feeding behavior total duration was  $83.25 \pm 49.47$  seconds.

Analyzing the duration of feeding behavior according to consumed forage type, shows that for coypu males the average

duration for maize grain consumption was  $51.75 \pm 51.72$  seconds and the average duration for alfalfa hay consumption was  $31.50 \pm 15,42$  seconds.

Table 3

Average values and dispersion indices regarding the feeding behavior duration (seconds) for different time slots of the day if coypus are fed with maize grain and alfalfa hay

Time slot	Average and dispersion indices	Males		Females		Total time	
		maize grain	alfalfa hay	maize grain	alfalfa hay	males (maize+hay)	females (maize+hay)
08 <sup>00</sup> -14 <sup>00</sup>	n	8		8		8	8
	X	1.003,38	629,13	1.113,38	313,00	1.632,50	1.426,38
	Sx	215,19	280,43	209,47	130,95	347,67	249,91
	s	608,99	793,61	592,80	370,59	983,91	707,26
	CV	60,69	126,14	53,24	118,40	60,27	49,58
	Sx%	21,44	44,57	18,81	41,83	21,29	17,52
	Val. min.	426	90	437	44	603	481
	Val. max.	1.989	2.279	2.049	1.165	3.173	2.341
14 <sup>00</sup> -20 <sup>00</sup>	n	8		8		8	8
	X	1.508,38	1.028,13	1.436,50	543,00	2.536,50	1.979,50
	Sx	93,34	401,68	110,11	148,10	448,23	231,32
	s	264,14	1136,76	311,60	419,12	1268,48	654,64
	CV	17,51	110,57	21,69	77,19	50,01	33,07
	Sx%	6,18	39,06	7,66	27,27	17,67	11,68
	Val. min.	1.177	100	1.067	73	1.277	1.140
	Val. max.	1.856	3.572	1.862	1.287	5.151	2.946
20 <sup>00</sup> -02 <sup>00</sup>	n	8		8		8	8
	X	955,00	1.417,63	1.035,88	1.214,50	2.372,63	2.250,38
	Sx	110,62	358,61	180,77	257,58	430,99	371,60
	s	313,06	1014,88	511,59	728,94	1219,70	1051,62
	CV	32,78	71,59	49,39	60,02	51,41	46,73
	Sx%	11,58	25,29	17,45	21,20	18,16	16,51
	Val. min.	516	96	120	201	612	321
	Val. max.	1.424	3.001	1.527	2.451	3.935	3.289
02 <sup>00</sup> -08 <sup>00</sup>	n	8		-	-	8	-
	X	51,75	31,50	-	-	83,25	-
	Sx	51,72	15,42	-	-	49,47	-
	s	146,37	43,63	-	-	140,01	-
	CV	282,84	138,51	-	-	168,18	-
	Sx%	99,94	48,94	-	-	59,42	-
	Val. min.	0	0	-	-	0	-
	Val. max.	414	92	-	-	414	-

n – numbers of specimens

x – mean

S – standard deviation

Sx – medium mean error;

CV – variability coefficient;

val. min. – minimum registered value;

val. max. – maximum registered value.

Average values and dispersion indices regarding the duration of one feeding behavior sequence, when coypus are fed with maize grain and alfalfa hay are presented in Table 4.

Average duration of one feeding sequence in the feeding behavior for coypu males was  $127.91 \pm 7.96$  seconds for grain maize consumption and for alfalfa hay consumption the average value obtained was  $122.11 \pm 20.53$  seconds.

For females, the average duration of one feeding sequence in the feeding behavior was  $134.27 \pm 7.78$  seconds for grain maize

consumption and for alfalfa hay consumption the average value obtained was  $96.32 \pm 10.12$  seconds.

Table 4

Average values and dispersion indices regarding the duration (seconds) of one feeding behavior sequence, when coypus are fed with maize grain and alfalfa hay

Average and dispersion indices	Males		Females	
	maize grain	alfalfa hay	maize grain	alfalfa hay
n	222	260	214	151
X	127,91	122,11	134,27	96,32
Sx	7,96	20,53	7,78	10,12
s	118,54	330,88	113,76	124,40
CV	92,67	270,97	84,73	129,15
Sx%	6,21	16,80	5,79	10,50
Val. min.	3	3	3	3
Val. max.	626	4.093	616	749

*n* – numbers of specimens

*x* – mean

*S* – standard deviation

*Sx* – medium mean error;

*CV* – variability coefficient;

*val. min.* – minimum registered value;

*val. max.* – maximum registered value.

In Table 5 are presented the average values and dispersion indices regarding the number of feeding reprises if coypus are fed

with maize grain and alfalfa hay within 24 hours.

Table 5

Average values and dispersion indices regarding the number of feeding reprises when coypus are fed with maize grain and alfalfa hay in 24 hours

Average and dispersion indices	Males		Females		Total reprises	
	maize grain	alfalfa hay	maize grain	alfalfa hay	males (maize+hay)	females (maize+hay)
N	8		8		8	8
X	27,75	32,75	26,75	20,13	60,50	46,88
Sx	2,50	10,04	2,50	1,44	11,86	3,09
S	7,09	28,41	7,09	4,09	33,57	8,74
CV	25,54	86,76	26,49	20,30	55,49	18,65
Sx%	9,02	30,65	9,36	7,17	19,60	6,58
Val. min.	21	11	20	14	34	34
Val. max.	39	100	40	26	139	60

*n* – numbers of specimens

*x* – mean

*S* – standard deviation

*Sx* – medium mean error;

*CV* – variability coefficient;

*val. min.* – minimum registered value;

*val. max.* – maximum registered value.

Analyzing the table above is shows that the average total number of males feeding reprises was  $60.50 \pm 11.86$  reprises, and the average total number of females feeding reprises was  $46.88 \pm 3.09$  reprises.

Analyzing the average values and dispersion indices regarding the number of

feeding reprises according to gender and type of feed is shows that for males, the average number of feeding reprises for grain maize consumption was  $27.75 \pm 2.50$  reprises and for alfalfa hay consumption the average number of feeding reprises was  $32.75 \pm 10.04$  reprises.

For females, the average number of feeding reprises if they are fed with grain maize was  $26.75 \pm 2.50$  reprises and if they are fed with alfalfa hay the average number of feeding reprises was  $20.13 \pm 1.44$  reprises.

Analyzing the coefficient of variability it is note that there is a great variability for both coypu males and females regarding the feeding reprises number.

After BURA et al. (1985), at rest adult coypus have two intense periods in which exercising their feeding behavior. These periods are in the time slots 9 -10 (13 '02") and 13 -14 (11' 27"). Period with a low activity in terms of feeding behavior manifestations is in the time slot 15-16 (2 '50").

## CONCLUSIONS

1. The duration of feeding behavior when coypus males are fed with maize grain and alfalfa hay was  $6624.88 \pm 889.69$  seconds, while for females the feeding behavior duration was  $5656.25 \pm 372.13$  seconds.

2. For coypu males the duration of feeding behavior when they are fed with maize grain and alfalfa hay is 7.66% of 24 hours, and for females duration of feeding behavior represent 6.54% in 24 hours.

3. If coypus are fed with maize grain and alfalfa hay, coypu males spend for maize grain consumption 53.110% of the average total time allocated for feeding behavior.

4. If coypus females are fed with maize grain and alfalfa hay, 63.394% of the average total time allocated for feeding behavior

represent the percent for maize grain consumption.

5. The most intense manifestations of feeding behavior when coypus are fed with maize grain and alfalfa hay occurred in 14<sup>00</sup>-20<sup>00</sup> and 20<sup>00</sup>-02<sup>00</sup> time slots.

6. Lowest intensity of behavioral manifestations when coypus are fed with maize grain and alfalfa hay was recorded in 02<sup>00</sup>-08<sup>00</sup> time slot.

7. Average total number of feeding reprises when coypus are fed with maize grain and alfalfa hay was  $60.50 \pm 11.86$  reprises for males and  $46.88 \pm 3, 09$  reprises for females.

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