

ORIGINAL PAPER

**METHODS FOR CAECECTOMY OF MUSCOVY DUCKS REGARDING BALANCE
EXPERIMENTS OF DIGESTIBILITY ESTABLISHING**

II. RECOVERY PERIOD

**МЕТОДИКА ЗА ЦЕКОЕКТОМИЯ НА МУСКУСНИ ПАТИЦИ ВЪВ ВРЪЗКА С
БАЛАНСОВИ ОПИТИ ПО СМИЛАЕМОСТ**

II. ВЪЗСТАНОВИТЕЛЕН ПЕРИОД

Dimo Penkov, Hristo Hristev, Rumjana Ivanova, Tinka Hristova

Agricultural University- Plovdiv, E mail: dipe@au-plovdiv.bg

Manuscript received: October 19, 2006; Reviewed: November 7, 2006; Accepted for publication: December 11, 2006

ABSTRACT

Some indexes of the recovery period of Muscovy ducklings after caecectomy have been studied. It' established, that the birds recover the water intake 9 hours, the excreting- 12-15 hours after and the feed consumption (by food offering 24 hours after operation) – 72-90 hours after the operation.

Keywords: Muscovy ducks, caecectomy, recovery period

INTRODUCTION

When identifying the methods of analyses in modern nutrition, many authors agree that bacterial activity in large intestines influenced significantly the results of digestibility [6, 7, 8 etc.].

In parallel experiments with roaster chickens for establishing digestibility of aminoacids by ileal and fecal methods, [5] mentioned that the percentage differences between the two methods depended on the forages, the average values varying as follows: for maize and soya groats – about 1 %, for sunflower and cotton groats – 2,4-2,8 % and for wheat – 13,1 %. The differences in the digestibility of the separate amino acids in the forages themselves also differed, the least being those of soybean meal – from 0,6 (lysine) to 5,8 percentage units (valine). Similar differences were established in maize, while in wheat the differences varied from 7,6 (arginine) to 19,8 percentage units (threonine). For the foods of animal origin, the lowest differences between the two methods of determining were reported in fish meal and blood meal (1,1 % and 1,4 % in average for the total digestibility) and the highest – in hydrolyzed feather meal (16.5 %). The author mentioned that despite the type of forage, some amino acids manifested greater differences in digestibility depending on the two methods applied (threonine) compared to others (phenylalanine).

In that relation, [3] summarized the publications of many authors, describing the standardized methods of balance experiments with birds of the hen species, which had experienced caeectomy.

As for ducks, the methods for ileal digestibility of the nutrient substances was applied by Ragland et al. (1999) [4] but they used another species and breed, i.e. Peking ducks. We conducted operational intervention on 62-week old Muscovy drakes for removing the caecum [2].

The aim of the present study was to follow some indices of the postoperational period of recovery of the Muscovy drakes after the caeectomy.

MATERIAL AND METHODS

Four 62-64 weeks old Muscovy drakes were selected for the experiment. The surgical intervention was carried out at the surgery laboratory of the Poultry Service of the Experimental and Training Estate of the Agricultural University – Plovdiv. Immediately after operation the birds were put in separate reanimation units (picture 1), equipped with individual feeding racks and watering troughs. The trays for excrement collection were covered with polyethylene folio and the excrements were measured when changing the folio. Water and food intake were measured as a difference between the amounts supplied at the previous and the next hour by scales with a precision of 1 g, including also the spilled amounts. Re-feeding the birds with combined forage containing 11.8 MJ of exchangeable energy and 18 % of crude protein began 24 hours after operation. The dry matter content in the excrements was established following the adopted methods [1].

RESULTS AND DISCUSSION

Table 1 presents the intake amounts of water after the operational intervention. Despite the significant individual differences, the tendency of recovering was indisputable. Practically, there was not a big difference in the average intake amounts of water from the 0 to 3rd hour (23.25 g) and from 3rd to 6th hour (28.00 g), as well as in the amounts drunk by the separate individuals. The gradual recovery of water intake started from 7th-8th hour and completed at 15th-16th hour after the surgical intervention (Figure 1).

Concerning the recovery of excretion from cloaca, it was observed that the excreted amount increased gradually from the 3rd to 12th hour after which a relative stability was reported until the 30th hour (within the limits of 2.3 to 3.1 g of dry matter), then abruptly increased and for 12 hours (36th-48th hour after operation) the drakes excreted 14.1 g of dry matter in average. During the next 12 hours

Table 1. Recovery of water intake by operated 40-42-week old Muscovy drakes g (n=4)*

Hours after the operation from...to	\bar{X}	Sx	Sx%	From... to Min – Max (g)
0-3	23.25	1.97	8.49	20-28
3-6	28.00	3.39	12.11	20-35
6-9	41.25	5.54	13.44	35-55
9-12	64.25	4.15	6.46	55-75
12-18	135.5	7.71	5.69	120-152
18-24	136.25	6.88	5.05	120-150

*Note: Splashed water from the troughs was also reported.

(from 48th to 60th hour after the intervention) - 32.26 g of dry matter in average were excreted – Table 2, Figure 2.

The abrupt increase of the excreted amounts after 24th hour was also due to the ad libitum food consumption after 24 hours – Table 3. It should be mentioned that at the beginning of feeding as well as in the following periods, no blood traces were found in the excrements.

Food depriving for a certain period is a major rule after surgical intervention in the digestive tract. That period for birds is from 24 to 48 hours. In our experiments food was offered at 24th hour after the end of the operation. The experimental drakes displayed interest 8 to 15 minutes after filling in the racks. For the first 6 hours the average amount of the consumed food was 52.25 g and for the period from 30th to 60th hour after the intervention the consumed amount of food for 12 hours did not differ significantly – Figure 3. It was just after 60 hours that an abrupt increase in the consumed amount of food was reported. What is more, after 72 hours the birds became more active, which was expressed in the increased quantity of forage used, a great part of which was spilled

by the drakes that was established visually. That is why we recommend using Muscovy drakes for balance experiments 72 hours after the surgical intervention.

It should be mentioned that in the applied scheme for removing the caecum by using local anesthesia only (Ivanova et al., 2006) the experimental birds were very active immediately after placing them in the individual recreation units (Picture 1). All the operated birds survived and preserved their vital activity even after conducting balance experiments with them (Picture 2).

CONCLUSIONS

Muscovy drakes recover their ability to drink water almost immediately after caecectomy. They start drinking large amounts of water 12 hours after the surgical intervention.

The experimental birds started excreting as early as the 3rd hour after operation and they reached the maximum excretion 12-15 hours after operation.

When offering food 24 hours after operation, the drakes

Table 2. Period of recovery for the separate excretes in operated 40-42-week old Muscovy drakes - g ACB(n=4)*.

Hours after the operation from...to	\bar{X}	Sx	Sx%	From... to Min – Max (g)
0-3	0.425	0.11	26.09	0.2-0.7
3-6	0.600	0.11	18.00	0.3-0.8
6-9	1.600	0.16	9.88	1.2-1.9
9-12	1.880	0.16	8.54	1.6-2.2
12-18	2.300	0.11	4.70	2.0-2.5
18-24	2.650	0.06	2.43	2.5-2.8
24-36	3.100	0.04	1.32	3.0-3.2
36-48	14.100	0.68	4.85	12.1-15.2
48-60	32.260	2.16	6.69	27.16-36.18

*Note: Excreta quantities were reported in total – fecal + urine.

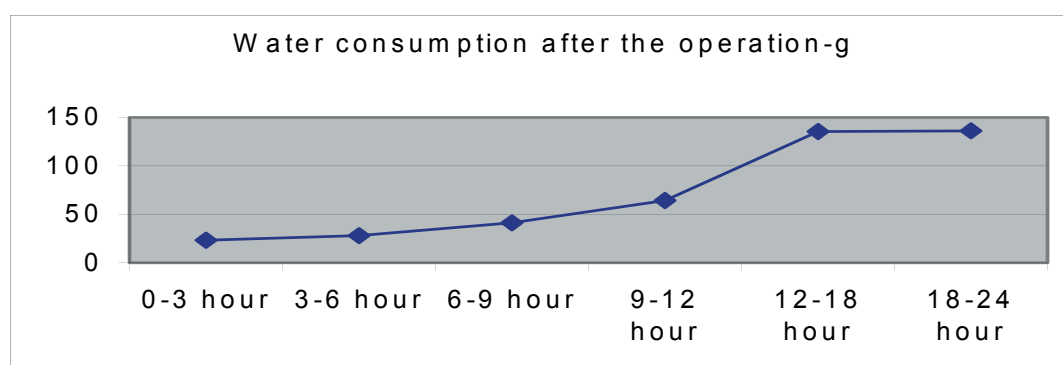


Figure 1. Water intake recovery period after operation – g

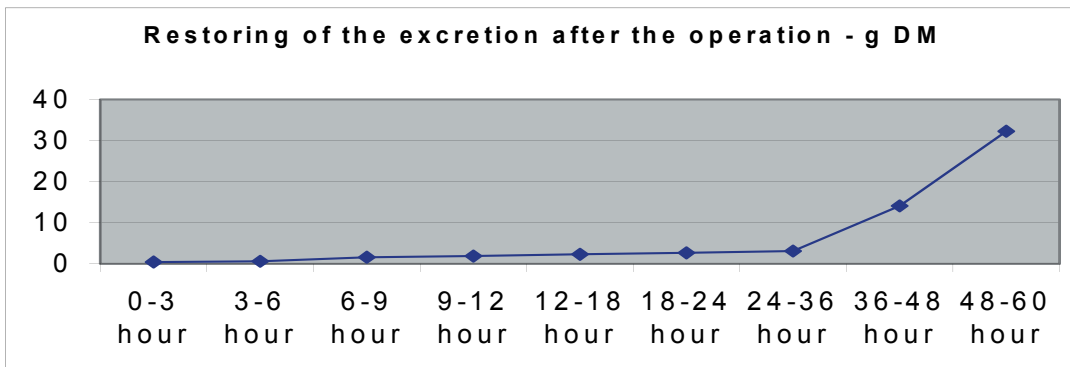


Figure 2. Recovery of excrement release after operation

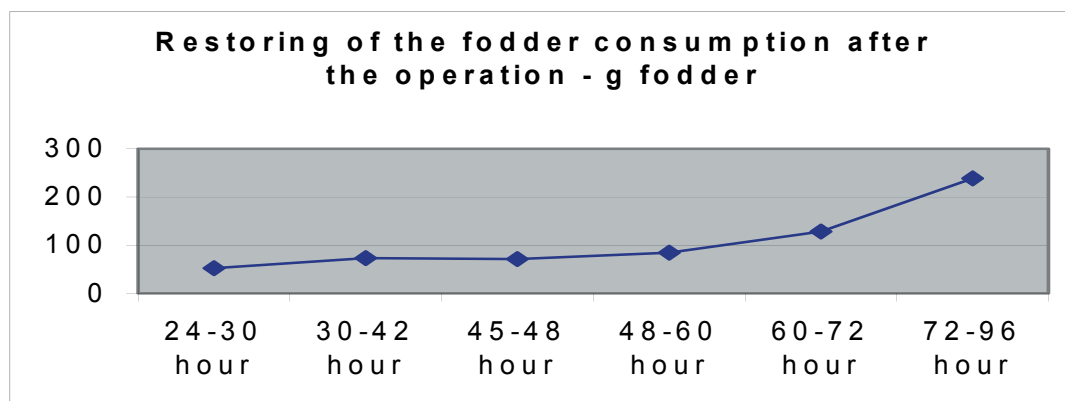


Figure 3. Recovery of forage intake ability after operation



Picture 1. Muscovy drake immediately after caecectomy



Picture 2. The same drake 45 days after caecectomy.

Table 3. Recovery of food intake by operated 40-42-week old Muscovy drakes - g (n=4)*

Hours after the operation from...to	\bar{X}	Sx	Sx%	From... to Min – Max (g)
24-30	52.25	6.98	13.36	38-70
30-42	73.00	6.57	9.00	55-86
42-48	71.00	7.10	10.00	55-88
48-60	84.25	9.84	11.68	59-105
60-72	128.25	7.09	5.52	111-145
72-96	238.50	32.16	13.48	186-332

*Note: The amounts of forage used were reported together with the losses from the feeding racks.

showed interest in feeding almost immediately. Until 72nd hour after operation the amount of ad libitum food intake increased and after 90th hour it was restored to the preoperational levels.

We recommend that Muscovy drakes after caecectomy be used for balance experiments on feeding at least 72 hours after surgical intervention, the optimal period for that being after 90 hours.

LITERATURE

1. AOAC, 1994, *Offic. Meth. For Analysis*, 14-th Rev. Edit., Wash. DC
2. Ivanova, R., Hr. Hristev, D. Penkov, 2006, *METHODS FOR CAECOECTOMY OF MUSCOVY DUCKS REGARDING BALANE EXPERIMENTS OF DIGESTIBILITY ESTABLISHING. I. SURGICAL INTERVENTION*, Scientific works AU- Plovdiv (in print)
3. McNab, J.M., J. C. Blair, 1988, Modified assay for true and apparent metabolizable energy based on tube

feeding, *Br. Poul. Sci.*, 29, 697-707

4. Ragland, D., C.R. Thomas, R.G. Elcin, D.J. Shafer, O. Adeola, 1999, The influence of cecectomy on metab. energy and amino acid digest. of select feedstuffs for white Pecking ducks, *Poul. Sci.*, 78 (5) 707-713

5. Ravindran, V, 2004, Standardising ileal amino acid digestibility of raw material- approach in broiler feed formulations, *Proceedings of WPC*, 8-13.06, Istanbul, Turkey

6. Ravindran, V., L. I. Hew, G. Ravindran, W. L. Briyden, 1999, A comparison of ileal digesta and excreta analysis for the determination of amino acid digestibility in feed ingredients for poultry, *Br. Poul. Sci.*, 40, 266-274

7. Summers, D.J., R. Berzins, A.R. Robblee, 1982, Ileal canulation of chickens, *Poul. Sci.*, 61, 1551-1552

8. Walls, I. R., D. Balnave, 1984, A comparison of amino acid digestibility bioassays for broilers, *Br. Poul. Sci.*, 25, 389-399

