Is there avoidance of the force feeding procedure in ducks and geese?

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Original article

Is there avoidance of the force feeding procedure in ducks and geese?

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Abstract — The debate on welfare issues related to the force feeding of ducks and geese involves understanding the reactions of the animals to the force feeding process. Two types of experiment were performed. Ducks and geese were trained to be fed in a pen 8 metres away from their rearing pen and were then force fed in the feeding pen. The hypothesis was that if force feeding caused aversion, the animals would not spontaneously go to the test pen. There were some signs of aversion in ducks, but not full avoidance, and there were no signs of aversion in geese. In another experiment, the flight distances of ducks from the person who performed the force feeding and from an unknown observer were measured. Ducks avoided the unknown person more than the force feeder. Their avoidance of the force feeder decreased during the force feeding period. There was no development of aversion to the force feeder during the force feeding process.

mule duck / geese / force feeding / avoidance / welfare

Résumé — **Y a-t-il évitement du gavage chez les canards et les oies ?** Le débat actuel sur les problèmes de bien-être liés au gavage des palmipèdes à foie gras implique que la perception de l'acte de gavage par les animaux soit connue. Deux types d'expériences ont été réalisées. Des canards et des oies ont été entraînés à aller se nourrir dans une case située à 8 mètres de leur case d'élevage puis ont été gavés dans la case d'alimentation. L'hypothèse testée est que, si le gavage est aversif, les animaux vont refuser de se déplacer vers la case de gavage. Chez le canard on observe certains signes d'évitement mais celui-ci n'est pas systématique. Chez l'oie il n'y a aucun signe d'évitement. Dans une autre expérience, la distance de fuite des canards a été mesurée par rapport au gaveur et par rapport à un observateur inconnu. Les canards fuient plus l'inconnu que le gaveur et fuient de moins en moins le gaveur pendant la période de gavage. Il n'y a donc pas développement d'une aversion du gaveur pendant la période de gavage.

canard mulard / oie / gavage / aversion / bien-être

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1. INTRODUCTION

Foie gras production is often criticised in terms of cruelty because it involves capturing the animal, introducing a pipe into the oesophagus and forcing the ingestion of large amounts of food through the pipe. This process is applied world-wide to approximately 30 million ducks and geese each year.

Previous studies in which physiological indicators of acute stress were measured provided no evidence that the process is perceived as acutely stressful by male mule ducks. Indeed, in ducks, the force feeding procedure only induces an increase in corticosterone level when the ducks are reared in floor pens or in collective cages, and only following the application of the first force feeding procedure. However, such significant increases have not generally been observed for ducks kept in individual cages [2–5]. It is thus likely that the increases observed are related to capture itself. This conclusion is further supported by the increase in corticosterone concentration observed after capture only [1].

The lack of rise in corticosterone levels after the first force feeding procedure is not due to a central or peripheral inability of the animals to respond, as ACTH injection or restrain stress can induce increased levels until the end of the force feeding period [3, 4]. In geese, the physiological responses were slightly different since an increase in corticosterone level still occurred after the third force feeding treatment [4]. However, increases were not observed later on and geese were only tested in collective cages.

It is very important to understand how the force feeding procedure is perceived by the animals to evaluate the welfare aspects of the process. In this study, the effects of the force feeding procedure on the behavioural responses of ducks and geese were investigated.

Animals normally show avoidance of stimuli associated with pain [8, 9]. If the force feeding procedure caused aversion, animals would be reluctant to go to places where they have previously been force fed and this should at least be expressed by an increase in the latency to go to the place where they are force fed. They would also increase their avoidance of the force feeder during the force feeding period and would be more frightened of the force feeder than of an unknown observer.

The first hypothesis was tested in experiments 1 and 2 in ducks and geese, respectively, whereas the second hypothesis was tested in experiment 3 in ducks only.

2. AVOIDANCE OF FORCE FEEDING IN DUCKS

2.1. Materials and methods

One hundred and twenty male mule ducks, resulting from the cross between male muscovy ducks (*Cairina moschata*) and female Pekin ducks (*Anas platyrhynchos*), were reared in four 12 m^2 pens (6×2 m) from day one to 11 weeks of age. The building where the ducks were kept was subdivided into 16 pens, 8 of which were used as rearing pens and 8 as test pens (Fig. 1). During this period they were fed with standard duck pellets (18% crude protein, 2700 $kcal \cdot kg^{-1}$) distributed ad libitum until week 6 and then with 170 $g \cdot day^{-1}$ per duck. The lighting programme consisted of 24 hours light during the first 4 days and 14 hours thereafter.

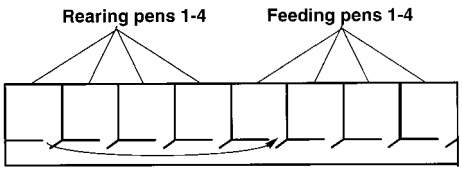

Figure 1. Schematic representation of a half of the experimental set-up.

At 11 weeks of age, each group was split into two groups and the ducks were then kept in 8 groups of 15 until the end of the experiment. Physical and visual contact between groups were prevented.

During the 14-day training period, ducks were trained to go spontaneously, once a day (in the morning), from the rearing pen to the test pen (8 m apart) where they received their daily food supply (200 g of cooked maize). During the first 3 days of training, the ducks were pushed out by the experimenter. After this initial training period, whenever the ducks did not move spontaneously after the door opened, the observer entered the pen after an interval of 30 s and pushed the ducks towards the door. The same procedure was repeated if the ducks did not enter the test pen within the required interval of 30 s. After all the food had been eaten (60 to 90 min), the door of the test pen was opened and the same procedure repeated. Because the proportion of tests in which ducks spontaneously left or entered a pen was low, we did not analyse latency, but only the proportion of groups spontaneously leaving or entering a pen.

At the end of this training period, four groups followed the same procedure (control) and the other four groups received the same quantity of maize using the force feeding procedure for a period of 10 days.

2.2. Results

In this experiment, training was incomplete and very few groups spontaneously left the rearing pen, but most of them entered the feeding pen by the end of the training period (Fig. 2, left hand side). It should, however, be noted that on days 13 and 14 most of the groups did not enter the feeding pen. This was apparently due to the absence of

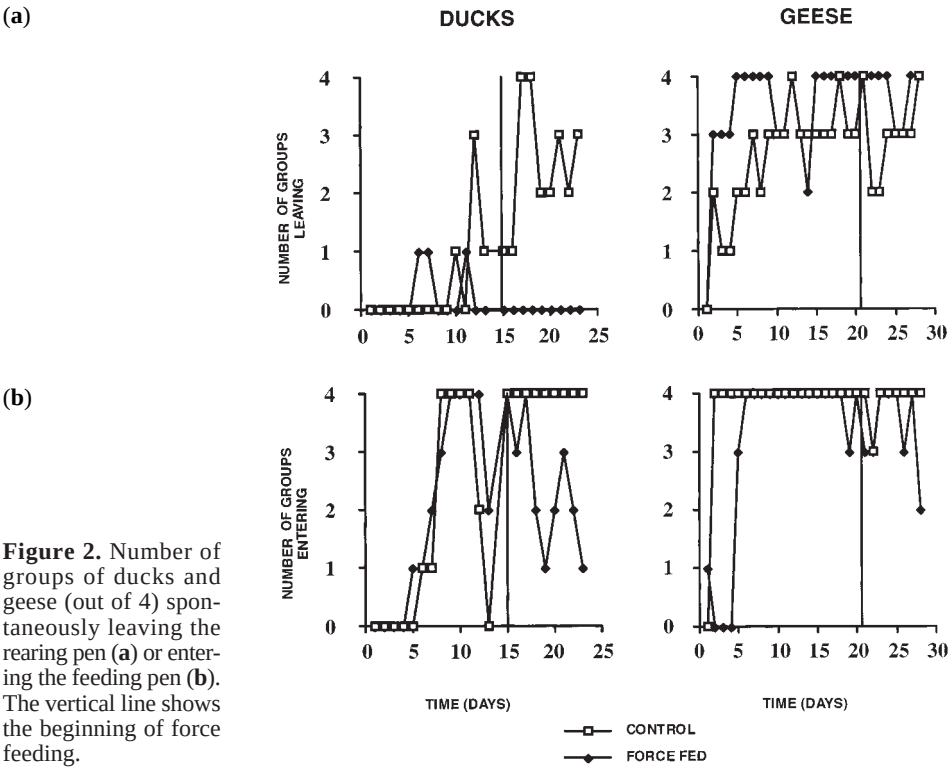

Figure 2. Number of groups of ducks and geese (out of 4) spontaneously leaving the rearing pen (**a**) or entering the feeding pen (**b**). The vertical line shows the beginning of force feeding.

the usual experimenter and his replacement by another person. During the test period, control animals spontaneously left the rearing pen in about half of the tests, whereas none of the force fed groups did so. The control groups also spontaneously entered the test pen during each test, whereas only about a half of the force fed groups did so. Detailed analysis of the data showed that all of the force fed groups sometimes moved spontaneously, but none did so on a daily basis.

2.3. Discussion

The problems encountered with the completion of adequate training in this experiment were surprising. In an unpublished preliminary experiment following a similar protocol [7] the training was complete after only 3 days of training whereas only a small proportion of ducks spontaneously left the rearing pen in the present experiment, even after 14 trials.

The proportion of control groups spontaneously leaving the rearing pen after the beginning of the experimental period was fairly high whereas none of the force fed ducks did so. All the control groups also entered the test pen spontaneously whereas only about half of the force fed groups did so.

These findings can be taken as evidence that the force feeding procedure is at least partially avoided by male mule ducks. It should, however, be noted that the replacement of the usual person by another during the training period (days 13 and 14) produced a comparable level of avoidance as the force feeding itself (only 2 groups out of 8 spontaneously entered the test pen on day 14).

3. AVOIDANCE OF FORCE FEEDING IN GEESE

3.1. Materials and methods

Eighty ganders were reared up to 15 weeks of age in one group and transferred to the experimental building previously described. They were then kept in 8 groups of 10 ganders per group.

The geese were fed a complete starter diet (18% crude protein, 2800 kcal·kg^{-1}) from 0 to 8 weeks of age and then a grower diet (16% crude protein, 2800 kcal·kg^{-1}). They were fed ad libitum up to 4 weeks of age and feed was restricted thereafter.

The lighting programme consisted of 24 hours light during the first 4 days, then 14 hours light until the 6th week of age and natural lighting (starting on March 23) thereafter.

The training period started when the geese were 15 weeks old, and lasted for 20 days, and they were tested over an experimental period of 10 days.

Control animals received 180 g of food per day during this test period whereas experimental animals were force fed with 150 g of maize and received 30 g of food in the feeder. The experimental protocol used was similar to that used for ducks in the previous experiment. Starting on day 4, the birds were pushed out by the experimenter after 15 s. Spontaneous leaving or entry was recorded only if no bird in the group needed to be pushed out. The latency of the first and last bird of each group to leave the rearing pen, enter the feeding pen, leave the feeding pen and enter the rearing pen again were recorded.

3.2. Results

All the force fed groups and only 3 out of the 4 control groups spontaneously left the rearing pen during the last part of the training period as well as during the testing period (Fig. 2, right hand side). The number of spontaneous entries into the test pen was higher for the control groups than for the force fed.

Latency decreased significantly during the training period (Tab. I and Fig. 3) and there was no significant treatment effect. During the test period, the latency to leave

Table I. *P* values of the treatment and time effect on the different latencies measured in geese during the training and test period (variance analysis with repeated measurements).

	Training		Test	
	Treatment	Time	Treatment	Time
Leave First	0.346	0.000	0.322	0.152
Leave Last	0.586	0.000	0.223	0.329
Enter First	0.242	0.000	0.334	0.127
Enter Last	0.419	0.010	0.238	0.294
Come Back Out First	0.140	0.000	0.235	0.001
Come Back Out Last	0.051	0.000	0.184	0.001
Enter Again First	0.116	0.000	0.042	0.126
Enter Again Last	0.106	0.000	0.016	0.332

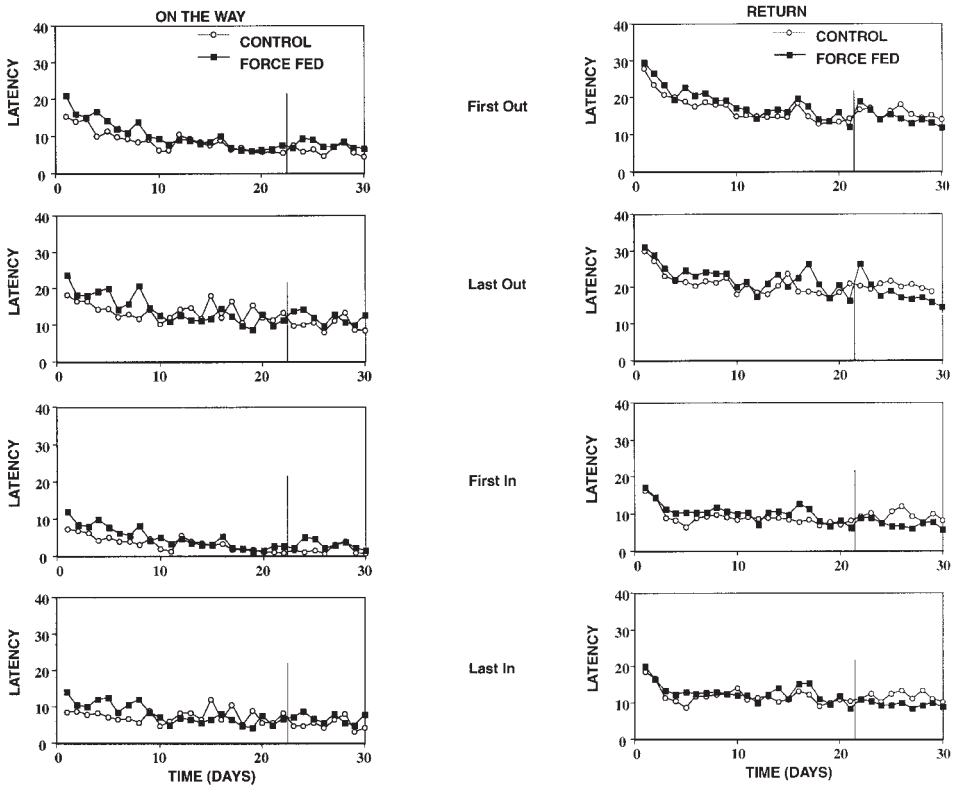

Figure 3. Mean latency for the first bird to exit, the last to exit, the first to enter and the last to enter on the way to the pen (first 2 graphs: rearing pen, last 2: feeding pen) and return phase (first 2 graphs: feeding pen, last 2: rearing pen) for the training and test periods. Vertical line shows the beginning of force feeding.

the rearing pen and enter the test pen was not affected by treatment or time (Tab. I). However, the latency to leave the feeding pen still decreased significantly during the test period. Latency, however, was not affected by the treatment whereas the latency to enter the rearing pen was significantly shorter for force fed animals.

3.3. Discussion

There were no obvious signs of avoidance of the force feeding procedure in geese. Indeed, the proportion of spontaneous exits and entries remained stable for the two treatments during the last part of the training period and during the test period. A non-significant trend in leaving the rearing pen and entering the feeding pen, with longer delays for the force fed groups than the control groups occurred during the test period, but this trend also occurred during the training period while all the animals were still receiving the same treatment.

4. REACTIONS OF DUCKS TO THE PERSON WHO PERFORMED THE FORCE FEEDING

4.1. Materials and methods

Seventy 13-week-old male mule ducks were housed in individual cages split into two rows of 35 cages. The force feeding period lasted 13.5 days with 2 meals per day, one in the morning and one in the afternoon, and was performed by a person who had no previous contact with the ducks. Ducks were force fed with ground maize mixed with water. The rearing environment and force feeding procedure were standard conditions for fatty liver production [6]. Four avoidance tests were performed during the course of the study by two observers, 2 to 6 hours after the force fed meal on days 3, 7, 9 and 11. For each test, one of the observers walked slowly along the rows of cages. First, this person looked at the nearest duck with its head outside the cage and walked until the duck withdrew its head into the cage. The distance between the observer and the focal duck was then measured, the unit being the number of cages (21 cm wide) between them. This test was performed by the caretaker performing force feeding and by a second person who had contact with the birds only during the tests. The order of the two observers and the end of the row at which they began were randomised. The two sets of measurements were carried out at, at least, 15 min intervals. The flight distances measured for the two observers were compared for each test day using the Mann and Whitney U-test.

4.2. Results

During the first test, the flight distances (Fig. 4) from both observers were similar

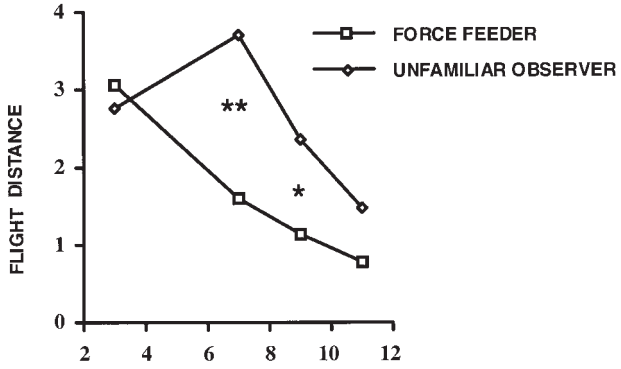

Figure 4. Flight distances of force fed ducks to the force feeder and an unfamiliar observer. * significant differences ($P < 0.05$, Mann and Whitney U-test).

($P > 0.10$). Ducks showed greater flight distances from the unfamiliar observer than from the force feeder on days 7 and 9 of the force feeding period ($P < 0.05$). During the 4th test (day 11), the differences between the two observers were not significantly different. After the first test (force feeder) as well as the second test (unfamiliar observer), the flight distances significantly decreased ($P < 0.001$).

4.3. Discussion

Initial flight distances were similar for both observers. The ducks reduced their flight distances from the two observers during the course of the study, but the distances decreased faster with the force feeder. Hence, the hypothesis of an aversion for the person who performed the force feeding is not confirmed.

5. CONCLUSIONS

It has been shown that animals are frightened by places where they receive painful stimuli and by people who inflicted painful stimuli [8, 9]. It was thus hypothesised that ducks and geese would be reluctant to spontaneously walk to and enter a place where they are force fed and that they would be more afraid of the force feeder than of an unfamiliar observer. This hypothesis of aversion was partly met for ducks in experiment 1. However, the force fed animals did not completely stop walking to and entering to the test pen. In addition, the force feeding procedure was apparently less effective in inducing extinction of the conditioning than changing the experimenter during the training period. Moreover, geese behaviour was not at all affected by the change from free- to force feeding. This is in agreement with the often reported field observation that in traditional farms the farmer only needed to call the geese to force feed them. Hence, the hypothesis of an aversion for the force feeding procedure was not confirmed.

The reduction in the flight distance from an observer during the force feeding process and the shorter flight distances from the force feeder than from an unfamiliar observer also showed that ducks do not perceive the force feeder as inflicting pain.

These results demonstrate that ducks and geese show little or no avoidance of the force feeding procedure, despite the fact that what might initially appear to be a slight disturbance (change in experimenter) can result in a significant change in behaviour.

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