

Response Of Sasso Chicks To Maternal Hen Call

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ABSTRACT

This study investigated the response of Sasso chicks to maternal hen calling on some behavioral patterns. Three groups of one day old Sasso chicks were randomly divided into three equal groups, each in a separate pen. In each pen a speaker wrapped in a white cloth was placed between the feeders and drinkers, in the first group (control) there was no sound emitted from the speaker (group one), in the other two pens the speaker was played 3 minutes per hour for 12 continuous hours (group two), while in the group three, the speaker was played 3 minutes per hour for 6 continuous hours. This was done for the first 4 weeks of chick's life, then all speakers were removed and all groups were received the same treatments. The results showed that at the age of 0-4 weeks the time of feeding, drinking, resting were significantly increased in case of group two and three, while the % of time standing and foraging were high in group one. During the age of 5-11 weeks, the resting time increased and the standing time decreased in all groups with advancement of age. Feeding and drinking time increased with age but not significantly between groups. There was no great difference in preening or other behaviors. Body weight, weight gain, feed and water consumption, feed / gain ratio were comparable among groups. At 0-4 weeks feed: gain ratio increased but not significant. Feed and water consumption increased significantly in groups two and three. Body weight and weight gain were significantly differed between groups; group two had the best gain and body weight followed by group three. The mortality % increase in control, but this was not significant. Results of this study suggest that if chicks heard maternal calls 3 minutes per hour for 6 or 12 continuous hours in the early life this will lead to good behavior which will be reflected on the welfare and performance of Sasso chicks.

INTRODUCTION

Sasso breed chicks becoming popular among small and big raisers. Its production performance is high, with delicious and tender meat and strong disease resistance. In natural environment, the hen aids chicks in finding feed by vocalization and by visual displays as pecking (1). Neurobiological studies have shown that the chicks of one week age have not completed the neural development of the visual cortex (2), and show age depended lateral asymmetry in response to visual stimuli (3). Chickens food calls appear to provide conspecifics with information about the presence of food (4). The white tailed ptarmigan hen's food call in a form of cultural transmission in which information regarding available food is disseminated from hens to chicks (5). Adult female Burmese red Jungle fowl attract the young to feed by means of a characteristic pecking motion and a food call vocalization (6). The duration of this display

dependent on stimuli originating with the young. Food calls is an arousal vocalization that directs the chick's attention to food items chosen by a hen (7). The presence and the behavior of maternal hens appeared to provide structuring factors for the expression of the chick's behavior (8) and can influence the memory ability of the offspring via noradrenalin in the brain (9).

The aim of this experiment was to determine if hearing the maternal hen calling 3 minutes per hour for 12 continuous hours or 3 minutes per hour for 6 continuous hours during early period of chick's life could affect the behavior and performance of artificially hatched Sasso chicks, and to assess the welfare of artificially incubated Sasso chicks.

MATERIALS AND METHODS

This experiment was conducted at the Faculty of Veterinary Medicine, Moshtohor,

Benha University. A total of 150 one - day old chicks were used in this study. After weighing chicks they were divided into three equal groups each of 50 chicks in three separate pens. The floor was covered with a 5 cm layer of wood shavings changed weekly. Chicks were brooded by using of electric heaters, the temperature was 33°C, and reduced by 2.8°C each week till it reached 21°C at 4 weeks till the end of the experiment (11 weeks). The lighting program was 24 hours light on day one, 23 hours light and 1 hour darkness from day 2 to 7th while it was 16 hours light and 8 hours darkness from 7th till the end of the experiment (10). Circular drinkers were placed between the feeders. All birds were fed *ad-libitum* a commercial diet: a slandered starter ration (3113 kcal / kg, 21.8 % crude protein) from one day old till day 21 and a grower ration (3216 kcal / kg, 20.83 % crude protein) from day 21 till the end of experiment (11 weeks).

In this study feeding calls from mother in the natural brooding stage raising their chicks was recorded by using of good quality tape and recorder, these sounds are made after a hen with her chicks has placed herself in front of the feeder and pecks at the feed while constantly giving a feeder call. In each pen a speaker wrapped in a white cloth installed between the feeders and drinkers. In the first pen the speaker was put without playing (to simulate that in other pens) group one. In the second pen (control) the maternal sound was played from a speaker 3 minutes every hour for 12 continuous hours (group two), the third pen had a speaker played 3 minutes every hour for 6 continuous hours (group three). These callings were played from one day old till the 4th week of age, after that all groups were received the same treatments. Sound and non sound pens were separated to eliminate cross over sound effect (II).

For studying the behavioral patterns of birds we used 10 birds, were chosen at random from each pen, and were individually tagged with colored wing and leg bands. All behaviors were recorded using video camera for 6 hours daily, 3 days per week in each

group alternatively, (from 7-9 A.M., 12 – 2 P.M, and from 5-7 P.M.) (12). Behavioral patterns recorded were feeding, drinking, preening, resting, standing, dust bathing, and foraging. The bird was considered eating if it was standing at the feeder and introduces the beak in the feeder. The bird was considered drinking if it stands at the drinker manipulating the drinker with its beak. Resting means cessation of movement and the bird's body in contact with the floor. Standing if birds still in upright posture and not moving. Preening if the bird nibbling or combing or stroking its feathers with its beak. Dust bathing is building a hole in the litter by bird then lying in it and tossing dirt on its back and wings.

Foraging means pecking and scratching in the floor. Behaviors were calculated as percentage of time in each.

For studying the birds performance, water intake was measured daily (ml / bird), feed intake was measured daily (g / bird), but it was calculated weekly. After measuring feed and water intake, feed and water were added to make up for those consumed by birds, so the feeders and drinkers distributed almost equal amount of diets and water. Feed spillage was collected by papers placed under the feeders (13). Feeders and drinkers positions were fixed throughout the experiment. Weekly body weights were assessed by weighting 10 birds from each pen to determine the body gain for determining the feed / gain ratio. Data sets were analyzed by using the statically analysis software (SAS, SAS institute Inc Release 8.1). Data are presented as mean \pm SEM. Data expressed as percentages were arc sine transformed before analysis.

RESULTS AND DISCUSSION

Results of this experiment showed that the presence of hen sound greatly influenced the behavior and performance of Sasso chicks. Results in Table 1 expressed the behavioral patterns of Sasso chicks during hearing the maternal hen calls (0-4 weeks). It was clear that the time spent in feeding and drinking tended to be significantly affected by hearing

the voice of hen, chicks in groups two and three stayed close to the feeders and drinkers and they spent more time feeding and drinking than control. There was direct relationship between feeding and drinking time, as the % of feeding time increased, the % of drinking time increased. Chicks raised by a hen spent significantly more time feeding, less time standing, than chicks housed without a hen (13). Chick's response to their mother's feeding activities was more pronounced than in the absence of feed call, they responded to this call by approaching their mother and increasing their pecking (7).

From the same Table, it is clear that the proportion of time standing and resting were significantly affected both by hearing the maternal food calling, and by the period of hearing. There was direct relationship between the time and period of hearing, the maternal hen calls and resting time. Birds in group two and three spent significantly more time resting and less time standing than control birds. This may be attributed to the heavy body weight of birds, as birds in the group two and three consumed more feed and had heavy body weight thus spent less time standing and more time resting this could be explained also by the increase in social behavior and reduction of disturbance. Chicks those heard maternal vocalization moved less throughout the pen, thus store more energy toward growth (12).

Hen brooded quail chicks remained close to one another than non brooded (14). Social motivation of brooded chicks appeared to be higher. They indicated that during their first days of lives, mothers influence the emotional and social behavior of their young. It was found that the resting time increased with age of birds. Time budget was affected by age with a large decrease in activity especially locomotors and foraging time (15,17).

The % of time spent in preening differed significantly between groups, it increased with age till the 4th week and it was highest at the 3rd week, birds in groups two and three spent more time in preening. This may be attributed

to the early development of the feathers that causes discomfort and irritation to the bird and need more preening.

The foraging time was significantly affected by the time of hearing maternal hen calls. An inverse relationship was found between feeding and foraging time between groups, as the feeding time increased there was reduction in the foraging time. The foraging time was lowest in groups two and three, this may be attributed to that birds who heard maternal calls gets all their needs from the feeders, while those in control group tend to scratch the floor for feed. This was true till age of 4 weeks (time of hearing the maternal calls), after that there was no difference. The foraging activity increased when animals search for feed (16,18). The frequency of ground scratching activity decline after 14 days of age (19). The proportion of time spent dust-bathing accounted for less than 1% of the chick's time. Dust bathing time was more in case of groups two and three, as the birds who heard the maternal calls were in close contact, this indicated that these birds had great social bond. Dust bathing in chickens typically occurred in groups of birds that are in close proximity (20).

Age generally affected the distribution of behaviors over the time of the day. Birds in control group spent more time standing than those in groups two and three, till age of 8th week, and then there was no difference. Results in Table 2 revealed that from age of 5-11 weeks, where there was no maternal hen calls, there was no difference in the time of feeding till age of 8th week. Birds in control group had more but not significant time in feeding, while birds in groups two and three spent more but not significant time in drinking behavior. Drinking time increased with age in all groups, this was explained by the combined effect of large body mass. The same was reported in broilers (17). Dust bathing was more at 5th, 10th and 11th weeks and birds in groups 2 and 3 spent more time dust bath than control.

Table 1. Effect of maternal hen call on behavioral patterns* (% of time) of Sasso chicks (0-4 weeks)

Group	Age	Feeding	Drinking	Standing	Resting	Preening	Foraging	Dust-bathing
1	1 st	9.39±2.23 ^b	3.36±2.33 ^b	18.45±3.34 ^a	40.12±2.23 ^b	2.73±2.12 ^b	9.03±0.56 ^a	0.25±0.11 ^c
	2 nd	9.41±0.15 ^b	2.78±0.13 ^c	17.29±0.18 ^a	50.12±0.36 ^a	3.59±0.32 ^b	9.8±0.12 ^a	0.13±0.20 ^c
	3 rd	9.92±0.01 ^b	3.11±0.22 ^b	15.09±0.46 ^a	50.24±0.51 ^a	6.33±0.25 ^a	9.11±0.81 ^a	0.18±0.14 ^c
	4 th	8.56±.23 ^b	2.83±0.61 ^c	17.06±1.21 ^a	52.11±0.53 ^a	6.02±1.36 ^a	7.02±2.12 ^b	0.19±0.25 ^b
2	1 st	17.02±0.23 ^a	4.61±0.14 ^a	14.25±0.12 ^b	48.63±0.25 ^a	2.69±0.22 ^b	5.51±0.14 ^b	0.3±0.23 ^d
	2 nd	18.03±0.25 ^a	4.32±0.12 ^a	8.11±0.45 ^c	50.18±0.24 ^a	5.23±0.24 ^a	7.1±0.45 ^b	0.51±0.12 ^a
	3 rd	11.02±0.47 ^a	3.73±0.23 ^b	8.71±0.13 ^c	60.01±0.12 ^a	7.5±0.45 ^a	7.03±0.29 ^b	0.65±0.14 ^a
	4 th	9.34±0.36 ^b	2.9±0.45 ^c	11.92±0.74 ^b	56.81±0.54 ^a	7.33±0.58 ^a	4.7±0.26 ^c	0.21±0.58 ^b
3	1 st	17.21±1.11 ^a	4.6±0.19 ^a	14.27±0.12 ^b	47.94±0.17 ^a	2.71±0.36 ^b	6.29±0.61 ^b	0.32±0.13 ^b
	2 nd	13.08±0.25 ^a	4.09±0.36 ^a	10.8±0.23 ^b	50.09±1.29 ^a	4.07±.45 ^b	7.03±1.21 ^b	0.43±2.61 ^b
	3 rd	11.13±0.25 ^a	3.6±0.84 ^b	8.91±0.45 ^c	54.7±0.11 ^a	6.73±0.13 ^a	4.18±0.14 ^c	0.59±3.66 ^a
	4 th	10.23±0.89 ^b	2.45±0.41 ^c	13.25±0.74 ^b	54.13±0.44 ^a	6.21±0.18 ^a	6.28±0.24 ^b	0.23±0.52 ^b

* Behavioral patterns were expressed as percentage of time

^{a,b,c,d} Means with the same superscripts in the same column did not differ significantly. $P \leq 0.05$

Group (1) control, Group (2) heard 3 minutes every hour for 12 hours; Group (3) heard 3 minutes every hour for 6 hours

On the other hand the resting time increased with age and it was more in groups two and three, this is due to the heavy weight of birds which was reflected on activities. It has been found that the locomotor activities decrease with age (21). The resting behavior varied considerably between groups, where birds spent 19 and 50% of their time resting, this difference may be explained by the difference in feed consumption, hence growth. Sitting increased with age and young birds were generally more active. Heavy broilers had much less standing and walking and much more time resting than slow growth (23). Broiler chickens dependent on age and rearing conditions, spend between 60 and 80 % of the time resting and lying increased with age (16,17, 24).

There were no differences in preening, and foraging behaviors between groups, but there was age difference as the preening behavior increased with age till the 4th week, after that it decreased. The behavior of birds is the most important indicator of welfare, although production parameters also reflect welfare level (25,26). Preening, sitting and standing increased in frequency with age, this may be due to these behaviors increased in relative frequency may be a result of decreased frequency of active behaviors or it may be due to motivation for these behaviors itself (22). The frequency of all behaviors except for drinking and aggression changed significantly with age, but the behavioral patterns differed in the direction of change with age.

Table 2. Behavioral patterns * (% of time) of Sasso chicks (5-11 weeks)

Groups	Age	Feeding	Drinking	Standing	Resting	Preening	Foraging	Dust bathing
1	5 th	6.03±1.11 ^b	3.21±0.29 ^b	13.33±0.24 ^a	62.54±0.38 ^b	4.42±0.25 ^a	6.07±1.20 ^a	0.14±0.25 ^a
	6 th	6.11±0.39 ^b	3.78±1.1 ^b	12.7±0.28 ^a	65.09±2.11 ^b	4.11±0.84 ^a	4.51±0.23 ^a	0.12±0.81 ^a
	7 th	8.17±0.25 ^b	4.01±0.18 ^b	10.81±0.14 ^a	66.79±0.38 ^a	3.92±0.71 ^b	3.36±0.42 ^b	0.1±0.56 ^d
	8 th	10.11±1.25 ^a	5.13±0.56 ^a	8.21±1.73 ^b	68.47±0.45 ^a	2.38±0.87 ^b	2.71±0.45 ^b	0.11±0.22 ^a
	9 th	12.33±0.17 ^a	5.14±0.29 ^a	7.31±0.42 ^b	68.06±.22 ^a	2.12±0.51 ^b	2.24±0.79 ^b	0.08±0.51 ^b
	10 th	12.71±0.25 ^a	5.18±0.21 ^a	7.31±0.71 ^b	68.11±1.31 ^a	2.22±0.49 ^b	2.11±0.53 ^b	0.16±0.11 ^a
	11 th	11.69±0.24 ^a	5.4±1.29 ^a	7.21±1.31 ^b	68.01±0.36 ^a	2.18±0.72 ^b	2.18±0.24 ^b	0.16±0.14 ^a
2	5 th	6.83±0.45 ^b	4.71±0.58 ^b	7.35±0.25 ^b	66.91±0.17 ^a	4.71±0.14 ^a	3.98±0.11 ^a	0.17±.12 ^a
	6 th	6.98±0.17 ^b	5.19±0.47 ^a	7.26±0.65 ^b	68.18±0.12 ^a	4.21±0.18 ^a	4.23±0.14 ^a	0.13±0.14 ^a
	7 th	8.11±0.47 ^b	5.74±0.25 ^a	7.16±0.25 ^b	68.18±0.56 ^a	3.08±0.54 ^b	4.13±0.56 ^a	0.1±0.11 ^c
	8 th	9.31±0.29 ^b	5.71±0.48 ^a	7.11±0.25 ^b	70.01±0.24 ^a	2.37±0.36 ^b	2.73±0.18 ^b	0.1±0.41 ^c
	9 th	9.83±0.56 ^b	5.95±0.25 ^a	7.02±0.25 ^b	70.29±0.32 ^a	2.36±0.89 ^b	2.11±0.26 ^b	0.08±0.47 ^b
	10 th	9.75±0.24 ^b	5.83±0.14 ^a	6.49±0.24 ^b	72.14±0.17 ^a	1.31±0.22 ^c	2.11±0.71 ^b	0.18±0.23 ^a
	11 th	10.18±0.24 ^a	6.01±0.18 ^a	5.49±0.24 ^b	72.28±0.22 ^a	2.11±0.14 ^b	1.78±0.23 ^c	0.17±0.15 ^a
3	5 th	7.3±1.11 ^b	4.59±0.49 ^a	10.43±0.10 ^a	62.08±0.31 ^b	4.53±0.23 ^a	4.55±0.28 ^a	0.19±0.61 ^a
	6 th	6.81±2.11 ^b	5.31±0.22 ^a	10.13±0.42 ^a	64.73±0.24 ^b	4.2±00.48 ^a	4.41±0.14 ^a	0.13±0.22 ^a
	7 th	8.37±2.12 ^b	5.43±0.28 ^a	8.41±0.35 ^b	66.7±0.33 ^a	4.01±0.08 ^a	3.89±0.7 ^a	0.1±0.59 ^c
	8 th	9.47±1.18 ^a	5.82±0.14 ^a	8.01±0.18 ^b	68.42±0.21 ^a	2.38±0.14 ^b	2.84±0.44 ^b	0.1±0.71 ^c
	9 th	10.11±085 ^a	5.82±0.29 ^a	7.28±1.18 ^b	68.71±0.18 ^a	2.11±0.19 ^b	2.31±0.25 ^b	0.08±0.11 ^b
	10 th	10.09±2.31 ^a	5.73±1.18 ^a	6.51±0.14 ^b	70.08±0.31 ^a	2.11±0.15 ^b	2.17±0.16 ^b	0.18±0.13 ^a
	11 th	10.19±1.12 ^a	6.11±2.11 ^a	5.89±0.24 ^b	71.9±0.22 ^a	2.44±0.28 ^b	1.91±0.14 ^c	0.18±0.68 ^a

* Behavioral patterns were expressed as percentage of time

^{a,b,c} Means with the same superscripts in the same column did not differed significantly. $P \leq 0.05$

Group (1) control, Group (2) heard 3 minutes every hour for 12 hours;

Group (3) heard 3 minutes every hour for 6 hours

Effect of maternal hen calls on feed intake, body weight, weight gain and feed/gain ratio of Sasso chicks during the period of hearing the calls (0-4 weeks), and after cessation of calls (5-11 weeks) are shown in Tables 3 & 4. During the first 4 weeks of life, it is clear that hearing maternal calls significantly affected the feed intake, weight gain and feed / gain ratio. Chicks in group two consumed significantly more feed (1073.72 g) than group three (1001.38 g), while those in control group had the lowest feed consumption (905.13 g), as they explore their surroundings with exploratory pecks. The same was reported by (2). While those who heard the maternal hen calls spent less time in exploration. Playing hen vocalization may have decreased the amount of exploratory behavior in the pen and they stay in close proximity to feeders and drinkers, moved less throughout the pen, thus store more energy for growth (11).

Also chicks in groups two and three had the greatest body weight gain (717.4 and 657.74 g), and lowest feed / gain ratio (1.50 and 1.52) for group two and three respectively. On the other hand, chicks in control group had the lowest gain (569.53 g) and the feed / gain ratio was high (1.60) as compared to the 2nd and 3rd groups. The greatest body weight gain in groups two and three was due to that chicks are more efficient in converting feed to body mass. Because they did not lose the energy in playing or exploration, but it was converted to gain in body weight. The lowest gain in control chicks indicated that the hearing of maternal hen calls hasten the movement of newly hatched chicks to feed and water and as the diet of chicks in this stage of age was high in protein this was reflected on growth, development and improvement in feed conversion rate. It has been stated that chick consumption more during the calling rates of hens, this may lead to chicks ate high-protein feed which is critical for chick growth and development (5). Chicks receiving recorded hen vocalization during the first 9 days of life were heavier, exhibited higher average daily gains as compared with control chicks (11).

During the period of 5-11 weeks, after cessation of maternal hen calls Table 4, it was clear that there was significant difference between groups. The feed intake increased in group two, it was 5268.99g and weight gain 1985.75 g, while feed / gain ratio decreased (2.65), more than birds in group three (2.77), on the other hand birds in control group had the lowest feed consumption 4994.69g, weight gain 1638.77g and highest feed / gain ratio (feed conversion) (3.05).

Table 5 illustrates the overall performance of Sasso chicks from 0-11 weeks of age. Total feed intake was significantly differed between control and treated groups, the lowest feed intake was recorded among control group (5900.12 g) as compared with (6342.71 and 6374.1 g) groups two and three respectively. Birds in control group drank significantly less amount of water (4877.08 ml), followed by 2618.81 and 2593.24 ml per bird in groups two and three respectively. It was clear that chicks subjected to maternal hen calls (group two and three) had lower feed to gain ratio as compared with those in control group. There was significant difference between groups. Group two had the highest gain (2702.97 gm) followed by group three (2591.74gm), while the lowest gain was obtained in control (2208.3gm). Following cessation of recorded hen vocalization (9 days), no significant differences were found between groups for body weight and carcass weight (11). There was direct relationship between feed and water consumption. Birds in groups two and three consumed significantly more water than control. The correlation between feed and water consumption at 0.98 was estimated (27).

The % of mortality was high but not significantly in control group than groups two and three this may be due to a failure to start feeding. Chicks stimulated with maternal feeding calls emitted at the feeder performed better than control and lower mortality rate (28).

Table 3. Effect of maternal hen calls on performance of Sasso chicks (0-4 weeks)

Groups	Feed intake (g)	Weight gain (g)	Feed/gain ratio	Water consumption (ml)	Mortality %
(1)	905.13 ± 16.02 ^c	569.53 ± 15.13 ^c	1.60 ± 0.12	284.59 ± 11.84 ^b	4
(2)	1073.72 ± 13.001 ^a	717.4 ± 5.74 ^a	1.50 ± 0.18	390.45 ± 11.55 ^a	2
(3)	1001.38 ± 28.13 ^b	657.74 ± 3.93 ^b	1.52 ± 0.18	389.77 ± 18.51 ^a	2

^{a,b,c} Means with the same superscripts in the same column did not differ significantly. $P \leq 0.05$

Group (1) control,

Group (2) heard 3 minutes every hour for 12 hours;

Group (3) heard 3 minutes every hour for 6 hours

Table 4. Performance of Sasso chicks after cessation of the maternal hen calls (5-11 weeks)

Groups	Feed intake (g)	Weight gain (g)	Feed/gain ratio	Water consumption (ml)	Mortality %
(1)	4994.69 ± 5.58 ^c	1638.77 ± 5.99 ^c	3.05 ± 0.15	2031.18 ± 11.21 ^b	2
(2)	5268.99 ± 12.09 ^b	1985.75 ± 11.38 ^a	2.65 ± 0.22	2228.36 ± 5.67 ^a	2
(3)	5372.72 ± 14.68 ^a	1934 ± 5.77 ^b	2.77 ± 0.10	2203.47 ± 2.18 ^a	2

^{a,b,c} Means with the same superscripts in the same column did not differ significantly. $P \leq 0.05$

Group (1) control,

Group (2) heard 3 minutes every hour for 12 hours;

Group (3) heard 3 minutes every hour for 6 hours

Table 5. Effect of maternal hen calls on overall performance of Sasso chicks (0-11 weeks)

Groups	Feed intake (g)	Weight gain (g)	Feed / gain ratio	Water consumption (ml)	Mortality %
(1)	5900.12 ^b	2208.3 ^c	2.67	4877.08 ^b	6
(2)	6342.71 ^a	2702.97 ^a	2.35	2618.81 ^a	4
(3)	6374.41 ^a	2591.74 ^b	2.46	2593.24 ^a	4

^{a,b,c} Means with the same superscripts in the same column did not differ significantly. $P \leq 0.05$

Group (1) control,

Group (2) heard 3 minutes every hour for 12 hours;

Group (3) heard 3 minutes every hour for 6 hours

CONCLUSION

Providing broiler chickens with a hen voice for 3 minutes every hour for 12 or 6 hours daily until four weeks of age has a positive impact on behavior, some production parameters which can be reflected on broilers welfare and also can be used as welfare assessment indicator.

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الملخص العربي

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أجريت هذه التجربة لدراسة مدى استجابة كتاكيت الساسو لسماع صوت الدجاجة الأم (هذا الصوت تم تسجيله من أم حقيقيه أثناء وجودها مع أولادها بعد التحضين الطبيعي) و مدى تأثيرها على بعض سلوكيات الطيور.

أجريت هذه التجربة على عدد ١٥٠ كتكوت ساسو عمريوم (تفريخ صناعي)، وتم تقسيمهم الى ٣ مجموعات متساوية في ٣ أماكن منعزلة، تم وضع سماعات بين العلافات و السقايات في كل مجموعة. في المجموعة الاولى (الضابطة) كانت السماعات لا تعمل و لكن تم وضعها لتمثيل بقية المجموعات. أما في المجموعتين الثانية و الثالثة فقد تم تعريض الكتاكيت لسماع صوت الأم ٣ دقائق كل ساعة لمدة ١٢ ساعة متصلة أو ٦ ساعات متصلة على الترتيب وذلك خلال ٤ اسابيع الاولى من عمرا لكتاكيت، وبعد ذلك تم رفع السماعات و إيقاف الصوت و تم معاملة الكتاكيت في كل المجموعات معاملة واحدة. وكانت النتائج كالتالي:-

١- من عمر يوم الى ٤ أسابيع وجد اختلاف معنوي في الوقت المستغرق في الطعام و الشراب و الراحة بين المجموعات حيث كانت الكتاكيت في المجموعتين الثانية و الثالثة تقضى وقت أطول من المجموعة الضابطة التي كانت تقضى وقت أطول في الحركة.

٢- وجد تحسن في معدل التحويل الغذائي و ارتفاع معدل استهلاك الطعام و الشراب في المجموعتين الثانية و الثالثة.

٣- في الفترة من (٥-١١ أسبوع) من العمر، وجد أن الوقت المستغرق في الراحة يزيد بينما قلت سلوكيات الحركة وذلك لزيادة نمو الكتاكيت بتقدم العمر.

٤- لم يوجد اختلاف معنوي بين المجموعات في بقية السلوكيات التي خضعت للدراسة.

٥- سجلت الطيور في المجموعة الثانية أعلى معدل زيادة في الوزن تليها الثالثة.

٦- لم يوجد اختلاف معنوي في نسبة النفوق بين المجموعات.

من هذه النتائج نقترح وضع سماعات تصدر صوت الأم ٣ دقائق كل ساعة لمدة ١٢ ساعة متصلة أو ٦ ساعات متصلة في أماكن تحضين الكتاكيت نظرا لانعكاسه على سلوك و انتاج الساسو لأن له تأثير ايجابي على سلوكيات أفراخ الساسو و بعض العوامل الانتاجية و معدل الرفاهية كما يمكن أن يستخدم لتقييم معدل الرفاهية في أفراخ الساسو .