BIBLIOGRAPHIC STUDY ON SOME ENVIRONMENTAL PARAMETERS IN INTENSIVE ADULT JAPANESE QUAILS RAISING

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Abstract

The purpose of this paper was to know the present state of research on some environmental parameters recommended by the literature in adult intensive quails raising. For laying birds, environmental factors are influencing egg production, exploitation of feed meal and resistance to breakage of eggs. As a result of the research it can affirmed that the limits of the temperature in the shelter of adult quail are between 17°C and 30°C. Temperatures over 32°C or below 5-10°C produce negative effects on the quails, in the sense that it reduces the production of eggs, it reduces weight at slaughter and it increases mortality. Relative air humidity in the shelter of quails may vary between 50% and 78% and the average humidity which is actually used is 60-70%. Related to the light, the best duration of light is between 14-18 hours of light/ day, this ensuring an optimum production. Optimum light intensity in the quail's shelter is 5 lux/m^2. Optimum density recommended for quail raising is between 150 cm^2 / bird and 211 cm^2 / bird. The level of battery cages in which the quails are exploited, influences the laying intensity, which is significantly lower by about 5-9% for the lowest level compared to other levels.

Key words: quail, environment, parameters, adult, raising

INTRODUCTION

The success in raising quail is provided by proper control of environmental conditions of the shelter. Environmental factors which are influencing fundamental growth for quails are: feeding and watering, temperature, light, ventilation and cage density. [20].

The researcher [11] from the California University, in co-operation with the U.S.A Agricultural Department established the growth parameters at the Japanese quail for those interested to have a knowledge base. The document was republished by Ernst R.A. (1978).

High temperature in the shelter of the quail conducted to reduced feed consumption and growth rate. [12]

MATERIAL AND METHODS

For the elaboration the presented bibliographical research several publications (scientific papers, books and magazines) referring at some environmental parameters (temperature, humidity, lighting, ventilation etc.) on the intensive raising of adult Japanese quails were studied.

RESULTS AND DISCUSSIONS

The temperature in the shelter of adult quails

For laying birds, ambient temperature influences the number of egg production, the egg weight, shell strength and feed consumption, therefore egg mass production, feed utilization and resistance of egg to breaking.

As the temperature in the shelter of adult quails, it is mentioned that a temperature over 32ºC (90 ºF) or a temperature below 5ºC (40 ºF) have negative effects on quails, meaning reduced egg production, reduced weight slaughter and increased mortality. [11].

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The [19] researchers have determined that the favourable temperature in increasing and exploitation of adult quails is between 23ºC – 32ºC (75 – 90 ºF). The researchers noted that quails are able to maintain a high rate of laying in optimal environment, but they are very sensitive to changing diet and environmental conditions.

In the [21] document, in a separate chapter system growth and reproduction in birds are presented (Avian Reproduction Test). Here, the authors noted that the recommended temperature in quail's shelter is 22ºC**,** with variations of ± 5ºC.

Temperature plays an important role in the process of laying. The optimum temperature in quails laying is 21ºC [18]. Summer temperature is often exceeded, without noticing reduction in egg production. Low temperatures have a negative effect on egg production. In any case, the temperature in laying quail housing should not fall below 18ºC, and should not exceed 30ºC. The temperatures under 10ºC lead to shedding of birds and laying for 1.5 - 2 months. The temperatures above 30 – 35ºC may have negative repercussions on the egg production and can cause various diseases. Temperature changes were also negative influences on egg production.

French specialized literature [1] recommended a level of temperature in adult quails housing between 22ºC and 24ºC, lower than the recommendations of Japanese breeders. The researcher [1] notes the fact that in an ambient temperature below 10ºC (winter) or over 30ºC (summer) the quails suffer and reduce their egg production.

In an experiment conducted in Turkey by [2], on tried to determine the high temperature effect on the viability of poultry and egg production. Therefore several groups have been organised according to temperature and humidity. In the experiment the following levels of temperature : 32.5º-34.2ºC, 33.0–34.8ºC, 34.0–35.0ºC, 34.0–35.4ºC, 34.1–35.1ºC, 34.5–35.8ºC, 34.0–35.3 ºC, 34.1–35.1ºC and 33.7–34.7ºC have been used. The conclusion reached by researchers is that the viability and egg production of quails was not significantly affected by high temperature in the shelter, the percentage of laying was normal for this age (over 80% during 11 – 19 week of egg production).

In an experiment conducted in Iran in quails laying raising by [17], a temperature in quails housing of 20ºC was used.

In a study conducted in Poland by [16] on the quail laying stock referring the diet of quail, a temperature of 20-22ºC was used.

[13] note that the temperature in adult quails housing is between 10ºC and 22.5ºC.

In the other study conducted in Poland by [4] on an adult quails effective of reproduction an average temperature in quails housing of 22ºC was used.

In a study conducted in Romania by [10] about the influence of battery cages levels from the egg production performance of quails an ambient temperature between 24-26ºC in the housing of adult quails was used with good results. In a study conducted in the Republic of Moldova by [15] from the Veterinary and the Breeding Animals Institute the influence of the temperature on the egg production performances was studied. For this, four groups that were exposed at different levels of temperature and humidity in the shelter were established.

Regarding the temperature level of the adult shelter, the results of the study indicated that the most favourable level of the temperature is 23ºC; this level provides the best egg production and egg weight compared with other levels of temperature (21ºC and 24ºC). It must be said that the shelter is an average value, which means that it varies by season (summer temperature is higher, and winter temperature is slightly lower).

The relative humidity of the air of quail's shelter

The relative humidity of shelter influences growth and the productivity of birds, causing the discomfort or comfort, especially their heat. In the [21] document, the "Avian Reproduction Test" chapter, the relative humidity recommended that housing growth in adult quails is between 50 % and 75 %. In an experiment conducted by [2] sought to determine the effect of low humidity on the viability of poultry and egg production. Therefore several groups have been organized

according to the temperature and humidity. So, it used the following levels of relative air humidity: 45%, 42%, 41.4%, 42.2%, 44%, 48.2%, 40.8%, 42% and 46%. The conclusion reached by researchers is that the viability and quail egg production were not significantly affected by low relative humidity air shelter, laying at a normal rate for this age (over 80 % from 11 to 19 week of egg production).

In the study conducted in the Republic of Moldova by [15], the adult quails were exposed to different levels of temperature and humidity in housing growth. Regarding the relative air humidity, the results showed that the most favourable level provides the best egg production and egg weight compared to other levels of humidity (75% and 73%). It must be said that the relative humidity is an average value, which means that it varies by season (summer humidity is lower and winter humidity is higher).

In French specialized literature [1] recommended a level of relative humidity in adult quails housing growth of 70%, the recommendation is somewhat lower than the one recommended by the Japanese breeders.

In a study conducted in Romania by [10] about the influence of battery cages levels from the egg production performance of quails a level of humidity of 55 – 60 % in quail's shelter was used with good results.

The ventilation in adult quail shelter

Shelter ventilation is necessary to ensure a proper environment, the discharge of harmful gases produced by birds (carbon dioxide), manure and bedding eventually (ammonia, hydrogen sulphide, dust, etc.), renewal of necessary, oxygen breathing, the eventual evacuation of excess moisture (in evaporation, respiration of birds) and heat (summer) [13].

The [11] researchers noted that if the birds are kept in a group air should be periodically refreshed (concentration of ammonia, as an indicator in this respect).

The [18] researcher recommends using a standard ventilation 4 – 5 mc/kg capita/hour.

The same is recommended by [1] citing a specialist in French literature.

[3] indicates that the oxygen consumption of birds with their size. They require, therefore, more than anything else, to periodically remove air refreshed noxious gases, even if this leads to energy loses.

Elimination of vitiated air can be done either by using natural ventilation or artificial ventilation. If properly designed, natural ventilation gives better results in adult quail as avoiding cold drafts during the autumn - winter, which is particularly harmful to adult quails. In closed shelters, air exchange is made for all birds, forced or artificially by mechanical ventilation. Use dynamic ventilation most often by pressure. A system of ventilation holes distributed in different areas and linked in a network that acts regularly is recommended.

Ventilation intensity is determined by the ammonia and litter humidity, temperature and dust from the atmosphere. Dust is caused by overheating and excess air ventilation. Ventilation is adjusted and daily scheduled.

Light regime in adult quail shelter

Lighting plays a significant role on reproductive development and persistence curve lay the quails. Light affects bird's trough the day, variations in durations, intensity and spectrum. The researcher [11] noted that maintaining a good level of egg production in growth light regime and operation of adult quails must be 14 – 16 hours light/day. If you want to obtain more meat per unit area a light regime of 8 hours light/day can be used, and also to prevent the occurrence of sexual maturity. In a study conducted by [8] the influence of lighting on egg production in Japanese quail in terms of light intensity and light colour on the egg production was studied. The Report of the Institute of the Laboratory Animal Resources of the National Research Council in Washington, Standards Committee, Subcommittee on Standards Poultry (1969) presented "Standard and Guidelines for Growth, Care and Management for Japanese quail '(Coturnix coturnix japonica). Standards have been developed by a team of researchers led by [7] for the U.S. National Academy of Sciences. The report recommends a regime of 16 hours light to 8 hours of darkness, used

since the period of youth and faster installation determines sexual maturity in males, and a faster start for laying females. With respect to luminous intensity housing growth, the Report recommends 10 Lux or 14 Lux, being able to use either incandescent or fluorescent lamps.

The [19] researchers have determined that the best duration is 14-18 hours of lighting light/ day, and ensuring that optimum production.

To obtain an optimum egg production, Lucceti Rizzoni, based on photoperiods of June month - the reproduction in the wild quail recommends a period of 16 hours light per day and a period of darkness of 8 hours a day, using however [18] vigil lamps.

Specialized French literature [1] recommended lighting of duration between 16 and 18 hours light per day, with a light intensity of 5 W / m increase in the shelter of adult quails.

In an experiment conducted in raising quails and hens by a team of researchers led by [17] lighting was used term housing growth in quails 15 hours / day (from 06.00 am to 21.00). In another study [16] for an adult quail breeding flock a light period of 17 hours a day shelter for quail has been used.

Before starting laying of light using a term of 10 to 12 hours / day. During the laying period lighting is practiced by 14 to 18 hours / day with a light intensity of 5 W/m [13]. In a study conducted by [4] a breeding flock of adult quail a light program of 14 hours light and 10 hours darkness per day was used. In an experiment carried out in Turkey by a team of researchers led by [5] a light program of 14 hours light and 10 hours darkness per day in adult quail shelter was used. In a study conducted in Romania by [10] an effect on the influence of adult quail cages battery level on the production performance of adult quail was used for a period of 14 hours light / day and a light intensity of 4 W / mp in the house. In a study conducted by [4] a breeding flock of adult quail a light program of 14 hours light and 10 hours darkness per day was used. In an experiment carried out in Turkey by a team of researchers led by [5] a light program of 14 hours light and 10 hours darkness per day in adult quail shelter was used.

In a study conducted in Romania by [10] an effect on the influence of adult quail cages battery level on the production performance of adult quail was studied for a period of 14 hours light / day and a light intensity of 4 W / mp in the house was used.

Density per unit area in the shelter of adult quail

The [11] researcher notes that on should ensure a space of about 300 cm^2 for each bird watering 0.06 cm per bird front and 0.13 cm minimum per bird feeding front.

The [21] author's document mentions that the density per unit area must be 0.15 m/pair of birds.

The [1] a researcher recommended a density of 80-100 per square meter adult quail.

The [13] researcher mentions the use of a density per unit area of 120 breeding quail per square meter.

In a study conducted in Brazil by a team led by [6] sought to determine the influence of density per unit area on the production of Japanese quail eggs. For the four groups corresponding to four different densities used in the experiment were organized (264 cm^2 / bird, 211 cm^2 / bird, 176 cm / bird, 151 cm^2 / bird). The highest rate of laying (90.20%) was maintained for lot density of 176 cm^2 / bird, and if using increased lot density of 264 cm^2 / bird (86.88%), while percentages of laying the than the other groups (about 79%).

The conclusion reached by researchers is that reducing the accommodation space per bird implicitly leads to lower production performance (in particular egg weight). Egg production and feed consumption were lower when using density lots maintained 176 cm / bird, respectively 151 cm / bird. The investigations made that economically optimal is to use a density of 211 cm / bird.

In a study conducted in Romania by [14] sought to determine how performance is affected production in quail-egg layers of the population of meat "of Balotesti" for the period 1-35 weeks depending on the density lay in the cage or per unit area of

accommodation. For this performance were studied in three groups of quail production, batches that have used different densities upon check-in cage, that is a lot that the people were assured 150 cm^2 cage area / bird (group I) other with 120 cm^2 cage / head (group II) and a lot with 109 cm^2 cage / bird (group III). The results reached by different researchers indicate that the density of quails in a cage resulted in a production of 161.98 eggs per bird in group II, 12.9% higher in group I and by 10.5% lower in group III.

The specific consumption of mixed fodder of 50.53 g/egg in group II is less than 15% in group I, low density and 9.23% in the group with higher density. Average weekly mortality is significantly lower in distinct and separate group I significantly higher in group III to group II.

Overall, the percentage towards the productive performance of laying eggs in production environments, specific consumption and keeping livestock were higher in group I of quails, with the lower density compared to group II, with an average load of birds and that group III, with the highest density.

Density used in group II, which provides an area of 120 cm^2 cage / head, still allowed to obtain a larger number of eggs / m^2 cage by 7.7% compared to group I and 1.89% from group III, which is recommended for periods when demand for eggs and their price is very high. You can also make the recommendation that the normal market conditions, the first part of the curve lay to use a cage density of 120 cm^2 / head, and in the second part of it to make a grouping of birds using a density 150 cm^2 cage/head, thus increasing the profitability of space by releasing cages where other birds of the same age can be brought. In an experiment conducted by [10] was followed to determine the influence of performance level on battery cages for hens quail production of the adult population of Japanese quail. Following investigations and found that there are significant differences between the five levels of battery cages that are operating quails, meaning that the lowest level of average intensity of hens is significantly lower than other levels (by about 5-9% average laying intensity).

CONCLUSIONS

Following this research the following conclusions can be drawn:

Allowable limits of adult quail shelter temperature are between 17ºC [21] C and 30°C [1]. Researcher [11] indicates that a temperature over 32ºC (90ºF) or temperatures below 5ºC (40ºF) or 10°C [1, 18] have adverse effects on quails, in the sense that it reduces the production of eggs, reduced slaughter weight and increases mortality.

Relative humidity in the shelter of quails may vary between 50-55% [21, 10] and 78% [15]. Average humidity used practically is 60-70%.

Relating to the light, the researchers [19] and [13] recommended duration of illumination light between 14-18 hours/day, thus ensuring optimum production. Optimum light intensity quail shelter is 5 lux/m [8]

Optimum density is increasing quail is between 150 cm^2/bird [14] and 211 cm^2/bird [6].

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