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RESEARCH ARTICLE

FOOD INFLUENCE AND GROWTH RATE OF QUAIL (COTURNIX COTURNIX), PERIYAKULAM, THENI DISTRICT, TAMIL NADU, INDIA

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Coturnix coturnix, Millet, Ragi, Corn, Food and Growth.

ABSTRACT

Three pairs of Coturnix coturnix bird species were studied at the age of 4 weeks. These experimental birds were in a separate cage and fed on Millet, Ragi and Corn for six months. The growth was steady increasing period of January to June. Compared with both male and female of millet fed bird has highest growth 163 gram in weight the lowest growth was noted as Ragi fed on female 148 gram in weight. Food Consumption Food Assimilation, Food Conversion, Food Metabolized, Feeding Rate, Conversion Rate, Assimilation Efficiency, Gross conversion and Efficiency Net Efficiency also high in January and low in June.

INTRODUCTION

The Quail is a wild bird Coturnix genus which originated in Africa, Asia and Europe. As the partridge and the pheasant, it belongs to the Phasianidae family. The common Quail Coturnix coturnix Linnaeus, 1758 is a partial migrant. The most extended subspecies are the European Quail Coturnix coturnix coturnix and the Japanese Quail Coturnix japonica. The Coturnix coturnix is a wild bird, with seasonal laying capacity, and bigger growing potential with better hunting skills. Coturnix japonica is a domestic bird, more adequate for intensive production due to its qualities as a layer and its greater potential for growth.

Common Quail consumes vegetative matter; however, their protein intake is greater than that of Chinese painted Quail, Coturnix chinensis. Females require a high protein diet for breeding Johnsgard, 1988. Weed seeds, cereal, and small insects and their larvae, including beetles, true bugs, ants, earwigs, and orthopterans are consumed Alderton, 1992.

Doerr and Silvy 2002 reported that supplemental feeding on whole milo increased survival of birds on deep sand range sites, but it did not increase bobwhite densities. Feeding did not affect bobwhite density or survival on clay soils of the Gulf Coast or on red-sand loams of south Texas. Doerr and Silvy 2002 also found that whole milo supplied from winter through early spring did not increase reproductive success on any of their study areas. Improved food supply has been hypothesized to result in better body condition or reduced danger to stress or predation, thus increasing survival Doerr, 1988.

Improved food supply may alter time of reproduction, increase realized reproductive effort, or improve nurturing efforts. Stress in bobwhites is reflected by weight loss Robel 1972; Robel *et al*. 1974 and 1979 reduced fat reserves Robel, 1969 and 1972; Robel *et al*. 1974, 1979, and increased mortality Robel, 1965; Robel and Fretwell, 1970; Robel *et al*. 1979.

Exposure to food restriction, by either reducing the daily amount of food offered or limiting the time during which feeding can occur, is known to have detrimental effects on body mass gain in juvenile birds Blank *et al*. 1991; Barash *et al*., 1992; Gebhstdt-Henrich and Marks, 1993; Palo *et al*., 1995 and Leili *et al*., 1997. Chicks can adopt different strategies to maximize weight gain by reducing 24-h energy expenditure by decreasing activity, during the time no food is present. In this way more energy will be available for body mass increase. When food restriction is imposed by reducing the time during which food is available, birds can also try to improve weight gain by increasing food intake rates. This may be achieved by enlarging hoarding Powers, 1991; Bartness and Clein, 1994; Basco *et al*. 1996; Wood and Bartnesss, 1996.

Wit-Ter *et al*., 1995 studied the effect of unpredictable and restricted feeding conditions on body mass and feeding behavior in growing Japanese quail. In growing animals a substantial amount of the energy intake is needed for growth. It

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is plausible that unpredictable, restricted feeding conditions during early development may be more critical than in adults with serious consequences for both future reproduction and survival.

Plate 1 Experimental Birds of Coturnix coturnix

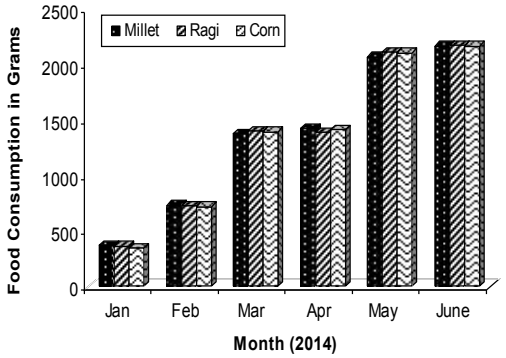

Figure 1 Food Consumption

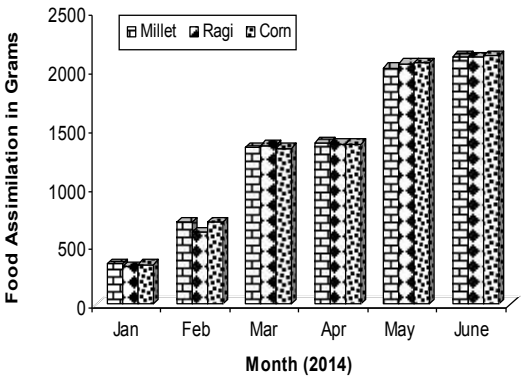

Figure 2 Food Assimilation

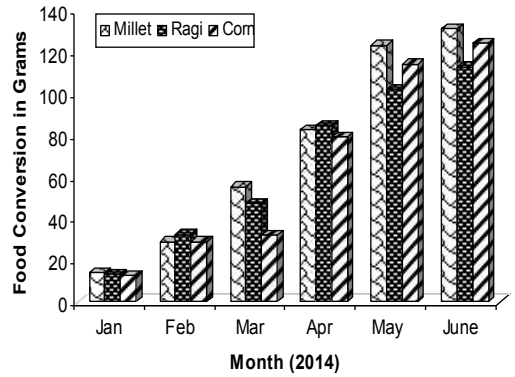

Figure 3 Food Conversion of C. coturnix on different food grains from January to June 2014

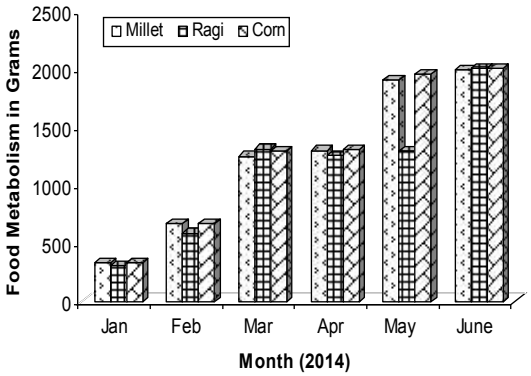

Figure 4 Food Metabolism of C. coturnix on different food grains from January to June 2014

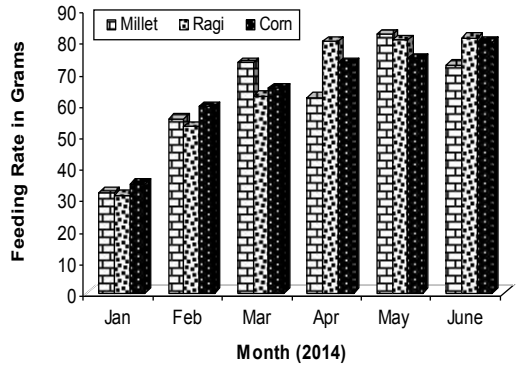

Figure 5 Feeding Rate of C. coturnix on different food grains from January to June 2014

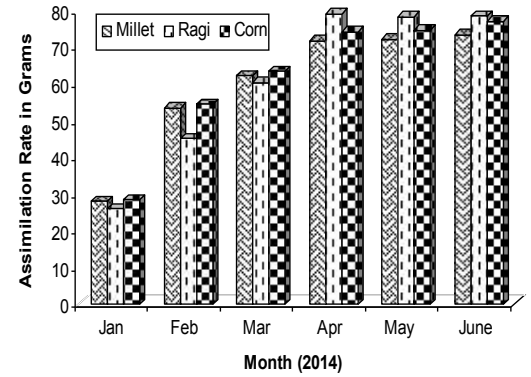

Figure 6 Assimilation Rate of C. coturnix on different food grains from January to June 2014

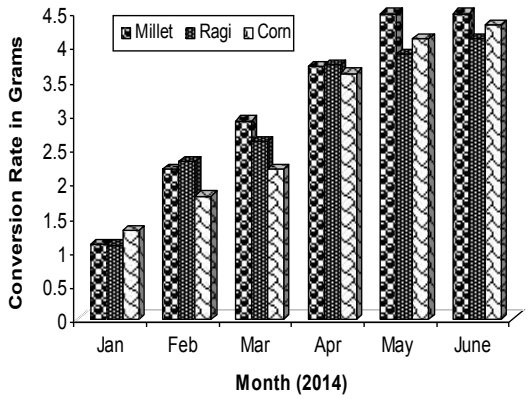

Figure 7 Conversion Rate of C. coturnix on different food grains from January to June 2014

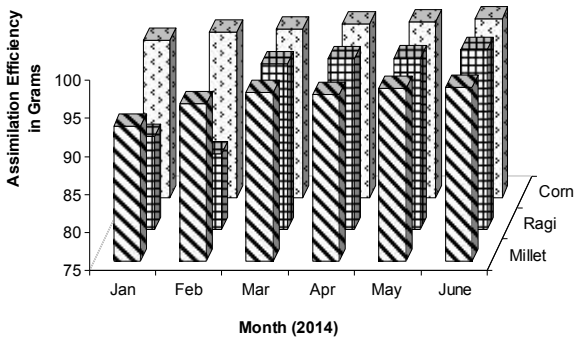

Figure 8 Assimilation Efficiency of C. coturnix on different food grains from January to June 2014

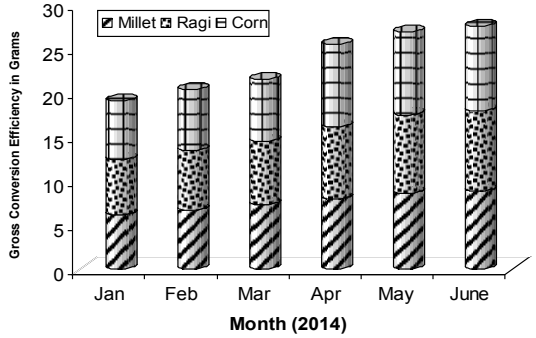

Figure 9 Gross Conversion Efficiency of C. coturnix on different food grains from January to June 2014

Table 1 Weight gain in grams male and female Coturnix coturnix in different grains from January to June 2014.

Months	Millet		Ragi		Corn	
	Male	Female	Male	Female	Male	Female
Initial Weight	33	32	35	31	33	33
January	48	45	46	48	43	46
February	63	60	65	63	60	59
March	89	87	83	80	80	79
April	114	117	120	118	113	110
May	153	159	139	134	148	145
June	165	163	146	148	159	154

Experimental Design

Coturnix coturnix bird species were selected for the study at the age of 4 weeks from a commercial farm at Madurai. The birds were kept in cages Length 60cm x Width 105cm x Height 75cm^3 with fiber bedding in access Coturnix coturnix. The birds were fed on starter food and water. The enough water was kept for the birds in dishes in the cage. The water was changed every day to keep it fresh and clean. Initial weights, of the birds were taken using birds weighing balance. After they were introduced into separate iron cages, the feeding period of the experimental birds were observed for six months from January to June, 2014. The experimental birds were segregated as three pairs of Coturnix coturnix. Each pair of experimental birds in a separate cage was fed on Millet, Ragi and Corn. The feed was given to the birds at 7 am each day and was observed. The excreta and the unfed grains were collected each day and it is weighed to calculate the assimilation rate Moreby and Stoate, 2000. Each month the birds were weighed to know the body mass gain fed on different grains.

RESULTS

In C. coturnix the growth per weight was gradually increased during the study period. The growth was high in June and low in January. In male C. coturnix the growth was high if fed on Corn than in Millet and Ragi, where as in female it was high if fed on Millet. But the growth of the Ragi fed female bird was much lower than the male. Table1.

Food Consumption

Bird species, the food consumed was low in January and high in June. The food consumed by the birds increased, as there was increase in the days of feeding. Figure1. C. coturnix showed high in food consumption of Ragi and followed by Corn and Millet.

Food Assimilation

The food Assimilation was low in January and it was high in June Figure 2. C. coturnix the food assimilation was high with Corn low with Ragi.

Food conversion

Food conversion of C. coturnix was observed in each month and it showed increases of food conversion steadily increasing during the study period Figure 3. C. coturnix, the conversion was high with Millet and low with Corn and Ragi. In C. coturnix the highest food consumption and assimilation was in Ragi and Corn respectively, but the conversion was high with Millet.

Food Metabolism

Food metabolism was high in June and low in January with little difference between March and April and May and June. There was a steady increase from January to June in both the Bird species but in May, the Ragi fed C. coturnix showed that it was low increases than in June Figure 4.

Feeding Rate

The feeding rate gradually increased from January to June. High feeding rate was recorded in June and low feeding rate was observed in January Figure 5. The highest feeding rate was observed in Ragi and lowest on Millet

Assimilation Rate

Figure 6 showed the assimilation rate high in June and low in January. Assimilation rare was high in Corn followed by Ragi and Millet.

Conversion Rate

The conversion rate was high during the month of June and low in January. There was a steady increase of conversion exist in both the bird species Figure 7. The conversion rate was high in Corn and low in Ragi and it was low in the species. The highest conversion rate was recorded in Millet. Low feeding

rate but high conversion rate were recorded in C. coturnix fed on Corn whereas conversion rate was low in Ragi fed bird species.

Assimilation Efficiency

The assimilation efficiency was high in June and low in January Figure 8. The highest assimilation efficiency was observed in Millet followed by Corn, and Ragi. Low assimilation efficiency was noted in Millet. In C. coturnix, highest assimilation efficiency was observed in Millet followed by Corn and low assimilation efficiency was recorded in C. coturnix fed on Ragi.

Gross Conversion Efficiency

Gross conversion efficiency in showed an increase from January to June. Figure 9. Millet, Ragi and Corn fed birds also more or less equal amount has increased.

DISCUSSION

It may be due to the acclimatization of birds, seasonal changes and energetic reason as in the study of Harject *et al*. 1962 in parakeets. Similar observations were made by Karthiga 2007. Bhanja *et al*. 1992 and Karthiga, 2007 studied that Millet coriander leaf was highly preferred and assimilated by the Love birds. They reported that by products which are cheap and plenty can be better utilized successfully in poultry as an energy source to replace costly ingredients. These values were in agreement with those given by Kanck *et al*. 1979; and Makarajothi 1993. John and Januncey, 1980 reported that the metabolic activities are depending upon the seasonal variation. The general metabolic response was an increase in metabolized energy in the autumn and a decrease in the spring which raise in the summer fluctuating around a constant level. Karthiga 2007 reported that metabolism was high in Millet – rice food but in this study it is in Corn followed by Ragi. Feeding rates of caged birds starlings indicated that metabolic rates ranged high and this was observed by Jeffrer *et al*., 2011. The assimilation and conversion depend upon the nature of quantity and quality of food as in the study of Pandian 1967. studied the feeding rate of caged starlings, the feeding rate of the birds increased as there was increase in days of feeding. Similar observations were found in the works of Stephenson *et al*. 1967 and Arunachalam *et al*. 1985. Growth of Indian River broiler chicks was significantly influenced by the type of food as in the study of Makarajothi 1993, where the growth was variable in different food. Gross conversion efficiency showed on gradually increases from every month. It may be depend upon the nature of temperature variation, as in the study made by Charles *et al*, 1997.

CONCLUSION

The male and female bird's weight has gradually increased from January to June 2014. Conversion was high with Millet and low with Corn and Ragi. Assimilation was high with Corn low with Ragi. The consumption was high with Millet and low with Corn and Ragi. Food metabolism was high in June and low in January with little difference between March and April and May and June. The highest feeding rate was observed in Ragi and lowest on Millet. Assimilation rare was high in Corn followed by Ragi and Millet. The highest conversion rate was recorded in Millet. The highest assimilation efficiency was observed in Millet followed by Corn, and Ragi. Gross conversion efficiency showed on gradually increases from every month.

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