

## STUDIES ON THE INFLUENCE OF AGE AND SEX ON THE MEAT CHARACTERISTICS OF JAPANESE QUAIL (*COTURNIX COTURNIX JAPONICA*)\*

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At present quail meat has been identified as a table delicacy and entered the meat-market in majority of the cities and towns in India. Singh *et al.* (1980) observed that in quails, sex had no significant effect on live weight upto 8 weeks. However, Narahari *et al.* (1983) reported differences in body weight and ready-to-cook yield, due to age and sex of the quail. Singh *et al.* (1981) also reported that there was significant increase in total meat yield of the carcass from 5 to 6 weeks of age in both the sexes. Pandey *et al.* (1982) recorded that the method and duration of chilling had no significant effect on pH of quail carcass. Further they observed a significant decrease in water holding capacity in quail carcasses under refrigeration and the duration of chilling had no significant effect on water uptake and water holding capacity. Since sufficient research work has not been carried out on the traits influencing the quality of the quail meat, a study on the influence of age and sex on pH, water holding capacity and extract release volume was undertaken, in order to understand the potential of the meat to keep well under stored condition.

### Materials and Methods

A batch of 48 number of Japanese quail of both sexes in equal numbers, at sixth and eighth week of age were utilized for this study. The birds were deprived of feed for 12h prior to slaughter, but provided with adequate quantity of drinking water. Prior to slaughter, the individual weight of the birds were recorded. Subsequently the birds were slaughtered and dressed as per the procedures of Indian Standards Institution (ISI, 1973). The carcass attributes like ready-to-cook yield and meat: bone ratio (meat and skin bone and cartilage) were recorded.

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The pH of the meat was assessed by the use of a digital pH meter, using a combination probe electrode. The water holding capacity (WHC) of the meat was carried out by adopting a filter paper press method recommended by Grau and Hamm (1953) with modification in the method of applying pressure, adopted by Koushik (1980). The extract release volume (ERV) of the meat was measured by the method of Pearson (1967). The above three characters were estimated at three different periods of storage namely, at 0h (stage I), 24h after slaughter in chiller storage (stage II) and after an equal period of storage in a freezer (stage III).

The data collected were subjected to statistical analysis as per the procedures of Snedecor and Cochran (1968).

## Results and Discussion

### *Carcass attributes:*

The mean slaughter weight (g), ready-to-cook yield (%) and meat: bone ratio of male and female Japanese quail at sixth and eighth week of age are furnished in Table I.

On statistical perusal it was observed that both sex and age had highly significant ( $P < 0.01$ ) influence on slaughter weight, ready-to-cook yield and meat: bone ratio. The average slaughter weight obtained in this study at sixth and eighth week of age is more or less similar to those reported by Singh *et al.* (1980). Female and older birds are consistently heavier and yielded higher ready-to-cook yield and meat: bone ratio than males and younger quails. Narahari *et al.* (1983) also reported significant differences in body weight and ready-to-cook yield based on the age and sex of the Japanese quail.

### *Keeping quality characteristics:*

The keeping quality characters, expressed as pH, WHC and ERV of both male and female quails at sixth and eighth week of age under three different periods of storage (stage I, II and III) are furnished in Table I.

There was a significant decrease in the pH, between stage I and stage II at both the age group, irrespective of the sex. It raised again at stage III. Similar observation was made by Mohan *et al.* (1986) in chicken carcasses, stored in three stages of storage periods. Further it may be seen from the table that female and younger (6th wk) carcasses had higher pH value than male and older (8th wk) carcasses.

The statistical analysis of the data on WHC revealed highly significant ( $P < 0.01$ ) differences between age and interaction between sex and age. The WHC was significantly lower at eight weeks of age than at six weeks. At sixth week, females had better WHC than males, but the reverse was true at eighth week of age.

Table I

Mean slaughter weight, ready-to-cook yield, meat:bone ratio, pH, WHC and ERV of Japanese quail as influenced by age and sex.

Characteristics	sixth week			eighth week		
	M	F	Mean	M	F	Mean
Slaughter weight (g)**	127.2 <sup>d</sup> ± 1.57	130.9 <sup>c</sup> ± 1.96	129.1 <sup>c,d</sup> ± 1.76	130.3 <sup>c</sup> ± 3.21	157.2 <sup>a</sup> ± 2.61	143.2 <sup>b</sup> ± 2.91
Ready to-cook yield** (%)	69.7 <sup>c</sup> ± 0.47	73.0 <sup>b</sup> ± 0.42	71.4 <sup>b</sup> ± 0.44	73.2 <sup>b</sup> ± 0.63	73.8 <sup>b</sup> ± 0.45	73.5 <sup>a</sup> ± 0.54
Meat:bone ratio**	3.50 <sup>1</sup> ± 0.05	3.64 <sup>c</sup> ± 0.05	3.57 <sup>c,d</sup> ± 0.05	4.04 <sup>b</sup> ± 0.07	4.48 <sup>a</sup> ± 0.12	4.26 <sup>a,b</sup> ± 0.09
pH**						
Stage I	6.37 ± 0.02	6.48 ± 0.02	6.43 <sup>a</sup> ± 0.01	6.35 ± 0.04	6.36 ± 0.03	6.36 <sup>x</sup> ± 0.02
Stage II	6.34 ± 0.02	6.45 ± 0.02	6.39 <sup>b</sup> ± 0.02	6.27 ± 0.03	6.28 ± 0.03	6.28 <sup>y</sup> ± 0.02
Stage III	6.47 ± 0.02	6.49 ± 0.02	6.48 <sup>a</sup> ± 0.01	6.41 ± 0.03	6.37 ± 0.03	6.34 <sup>xy</sup> ± 0.02
WHC (cm <sup>2</sup> )**						
Stage I	1.62 ± 0.18	1.45 ± 0.10	1.53 <sup>a</sup> ± 0.10	1.57 ± 0.11	2.17 ± 0.21	1.87 <sup>c</sup> ± 0.11
Stage II	1.45 ± 0.07	1.39 ± 0.09	1.42 <sup>a,b</sup> ± 0.05	1.73 ± 0.06	1.85 ± 0.12	1.79 <sup>c</sup> ± 0.07
Stage III	1.34 ± 0.06	1.24 ± 0.06	1.29 <sup>b</sup> ± 0.04	1.81 ± 0.13	2.15 ± 0.06	1.98 <sup>c</sup> ± 0.08
ERV (ml)**						
Stage I	32.90 ± 0.46	33.22 ± 0.43	33.06 <sup>b</sup> ± 0.30	32.46 ± 0.36	32.48 ± 0.22	32.47 <sup>a</sup> ± 0.20
Stage II	31.29 ± 0.43	31.54 ± 0.46	31.42 <sup>a</sup> ± 0.31	31.05 ± 0.32	31.27 ± 0.24	31.16 <sup>b</sup> ± 0.20
Stage III	30.85 ± 0.34	30.98 ± 0.46	30.92 <sup>a</sup> ± 0.29	29.70 ± 0.25	29.81 ± 0.19	29.75 <sup>b</sup> ± 0.16

\*\* Means for each trait bearing atleast one common superscript do not differ significantly ( $P < 0.01$ )

Futher, it may be noticed in the table. that the carcasses of six old quail had improved WHC upon storage, but such difference between storage period was not observed in eight week old quail carcasses. Pandey *et al.* (1982) observed that duration of chilling had no significant effect on WHC.

The statistical analysis of the ERV data revealed highly significant ( $P < 0.01$ ) differences among storage periods and between ages. However, sex and the interactions between sex, age and storage periods had no significant effect on ERV. The ERV was found to decrease with advancement of age and storage periods.

### Summary

The carcass characteristics and keeping quality traits of male and female Japanese quail at sixth and eighth week of age were studied. Irrespective of age, the female Japanese quail had shown superiority in slaughter weight, ready-to-cook yield and meat: bone ratio of males. The edible yields had increased with advancement of age. The pH, WHC and ERV were higher at sixth week of age than at eighth week of age and the later two traits were decreased with increase in storage periods. The pH had decreased 24h after slaughter, but increased again to the original levels 48h after slaughter.

### സംഗ്രഹം

കാടപക്ഷികളുടെ മാംസഗുണനിലവാരവും സൂക്ഷിച്ചു വെക്കാനുള്ള മാർഗ്ഗവും പഠനവിഷയമാക്കിയതിൽ പെൺ കാടപക്ഷി ആൺ പക്ഷിയേക്കാൾ ഈ ഗുണങ്ങളിൽ മുൻനിരയിൽ നിൽക്കുന്നതായി കണ്ടു.

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### References

- Grau, R. and Hamm, R. (1953) Eine Einfache methods Zur Bestimmung Der Wasserbindung Im muskel, Naturwissenschaften. 40:29 (cit. Hamm, R., 1960).

- I S I. (1973) Code for handling, processing, quality evaluation and storage. IS. 7049. Indian Standards Institution, New Delhi.
- Koushik, B. G., (1980) Influence of polyphosphates on the meat quality and shelflife of ready to cook commercial broilers. M. V. Sc., Dissertation submitted to Tamil Nadu Agricultural University, Coimbatore.
- Mohan, B., Narahari, D., Venkatesan, E. S., Ramamoorthi, R. and Alfred Jayaprasad, I., (1986) Studies on the influence of age and sex on the meat characteristics of broiler chicken. *Cheiron* (In press)
- Narahari, D., Thangavel, A., Prabhakaran, R., Venugopal, K. and Sundararasu, V. (1983) Dressing and cut-up yields of Japanese quails as influenced by age and sex. Abstracts: 10th annual poultry symposium of the Indian Poultry Science Association, Madras.
- Pandey, N. K., Mahapatra, C. M. and Goyal, R. C., (1982) Effect of various chilling methods on some quality factors of quail meat. *Indian J. Poultry Sci.* **17**: 121-125.
- Pearson, D., (1967) Assessing beef acceptability. A proposed specification based on chemical methods. *Fd. Mf.* **42** (11): 42:43.
- Singh, R. P., Srivastava, A. K. and Panda, B. (1980) Studies on slaughter characteristics of Japanese quail (*Coturnix coturnix japonica*) at different stages of growth. *Indian Poultry Gaz.* **64**: 12-17.
- Singh, R. P., Srivastav, A. K. and Panda, B. (1981) Meat yield of Japanese quail (*Coturnix coturnix japonica*) at different stages of growth. *Indian J. Poultry Sci.* **16**:119-125.
- Snedecor, G. W. and Cochran, W. G. (1963) The statistical methods. 6th ed. Oxford and IBH Publishing Co., Calcutta.

## STUDIES ON EXTENDING PART LACTATION RECORDS IN CROSSBRED DAIRY COWS\*

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In dairy cattle, rate of genetic improvement can be hastened through early culling of low yielders and early selection of suitable young bulls on the basis of their progeny performance. This can be done by selecting cows and bulls on the basis of their part records, provided that full lactation yield can be predicted from part lactation yields accurately. It also facilitates comparisons among cows at different stages of lactation, increasing rate of genetic gains by reducing the generation interval and the modelling of economic and efficient management systems. The present study was therefore undertaken to investigate the possibilities of predicting full lactation yields from various part records in Jersey and Brown Swiss crossbred cows.

The relationship between part and full lactation yields has been studied by several workers. Searle (1961); Van Vleck and Henderson (1961); Van Vleck (1962) and Mc Daniel (1969) reported that part records could be used to obtain sire summaries and early evaluation of sires even though a large number of records and probably more herds would be needed for this to be as efficient as full records. Bulgarian Brown cattle with different selection intensities for milk and milk fat resulted in similar response to direct (305-day yield) and indirect (120-day yield) selection (Angler and Susanin, 1979).

### Materials and Methods

Records on cumulative monthly milk yields of Jersey (93) and Brown Swiss (55) crossbred cows maintained at University Livestock Farm, Mannuthy during the period 1978–1983 were used for this study. The total milk produced by a cow during the first 30, 60, 90, 120 and 150 days of a lactation were considered as part lactation yields. Records upto the 4th lactation were included in the study. There were a total of 264 lactation records which included 174 lactation records of Jersey crossbreds and 90 lactation records of Brown Swiss crossbreds.

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