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BATHAEI (S.S.), LEROY (P.L.). Genetic parameters for pre-weaning growth traits of Mehraban Iranian fat-tailed sheep. *Revue Élev. Méd. vét. Pays trop.*, 1994, **47** (2): 235-238

Data corresponding to 975 lambs, progeny of 18 rams, born during the 1984-1990 lambing seasons, were used to estimate genetic parameters for birth weight, weaning weight, pre-weaning daily gain, and body weight at 30, 60 and 90 days of age. Genetic parameters were estimated from paternal half-sib correlations. Heritabilities for birth weight, weaning weight, pre-weaning daily gain, and body weight at 30 and 60 days of age were 0.35, 0.44, 0.33, 0.36, 0.39 respectively. Genetic correlations were mostly high and all positive, especially between weaning weight and weight at 60 days of age (0.77). The corresponding phenotypic correlations were mostly high and positive (0.80). No genetic antagonisms were found among the characteristics that were studied. Response to selection for weight at 60 or 90 days of age should be effective.

Key words : Mehraban sheep - Lamb - Genetic parameter - Growth - Liveweight - Heritability - Genetic correlation - Iran.

Heritability of growth traits in local chickens at 6 weeks in Nigeria

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EBANGI (L.A.), IBE (S.N.). Héritabilité des caractères de croissance chez des poules de race locale âgées de 6 semaines au Nigeria. *Revue Élev. Méd. vét. Pays trop.*, 1994, **47** (2) : 238-240

Les valeurs de l'héritabilité du poids corporel, de la longueur de la cuisse, de celle du bréchet et de la profondeur de la poitrine pour les poules indigènes du Nigeria âgés de 6 semaines, ont été obtenues à partir des données d'un modèle imbriqué. Cent soixante-dix poussins des deux sexes, issus de 5 coqs fécondant chacun 4 poules par insémination artificielle ont été utilisés. A l'éclosion, les poussins étaient marqués à l'aile et leur pedigree établi à partir des ascendants. Les moyennes de ces caractères étaient respectivement de 114,97 g, 3,48 cm, 3,35 cm et 3,22 cm pour le poids corporel, la longueur de la cuisse, celle du bréchet et la profondeur de la poitrine. L'héritabilité estimée à partir du père, de la mère et de la combinaison des indices de variance pour le poids corporel, la longueur de la cuisse et la profondeur de la poitrine était respectivement de 0,41, 0,66 et 0,36 ; 0,58, 0,14 et 0,36 et 0,58, 0,36 et 0,48. Ces mêmes valeurs, calculées à partir des parents et des indices de variance, étaient respectivement de 0,34 et 0,17 pour la longueur du bréchet. Ces résultats montrent que l'héritabilité à 6 semaines est moyenne ou élevée pour les caractères considérés.

Mots clés : Poule - Croissance - Héritabilité - Poids - Mensuration corporelle - Insémination artificielle - Nigeria.

Introduction

Information on genetic parameters of growth traits in the Nigerian local chicken is comparatively scanty in the literature. NWOSU (6) obtained heritability estimates for 4-, 8-, 12-, 16- and 20- week body weight as 0.36, 0.38 and 0,37 ; 0.32, 0.36 and 0.34 ; 0.36; 0.38 and 0.37 ; 0.40, 0.49 and 0.44 and 0.33, 0.43 and 0.38 from sire, dam and combined variance components, respectively. OLUYEMI (7) obtained a heritability of 0.31 for 12-week body weight. There was no report in the available literature on heritability of shank length, keel length and breast width. The aim of this study, therefore, is to contribute further information regarding heritability of body weight (W) using local chickens at 6 weeks and to estimate heritability of other growth traits such as shank length (SL), keel length (KL) and breast width (BW) at this age.

Material and methods

The chicks for the experiment were obtained from matings between sires and dams randomly selected from a base population of random-bred, non-selected local fowls maintained at the University Poultry Teaching and Research Farm.

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Reçu le 13.1.1994, accepté le 6.9.1994.

The mating design was hierarchical with 5 sires used, each mated with 4 dams. Each dam produced a number of offspring. The breeding hens and cockerels were kept individually in cages and fed layers mash *ad libitum*. Water was provided continuously. All the matings were by artificial insemination, using undiluted semen collected from the sire by the massage technique (2, 5). Eggs were collected, pedigreed and stored in an air-conditioned house for at most two weeks before incubation. Day-old chicks were produced in 8 hatches and on hatching, the chicks were wing-banded, pedigreed by sire and dam. They were also inoculated against Newcastle disease by the intra-ocular method. They were then transferred to the University farm and brooded in a deep litter floor pen measuring 4.5 x 3 m (13.5 m^2). Commercial chick mash was provided *ad libitum* up to 6 weeks when the chicks were weighed by use of a sensitive scale. The shank length, keel lenght and breast width were also measured by use of a graduated ruler.

Statistical model and analytical technique

The following mixed model was used:

$$Y_{ijkl} = \mu + H_i + S_j + D_{jk} + e_{ijkl}, \text{ where,}$$

Y_{ijkl} = observation of the l^{th} progeny of the K^{th} dam mated to the J^{th} sire in the i^{th}hatch ; μ : overall mean , H_i : fixed effect of hatch ; S_j : random effect of sire ; D_{jk} : random effect of the K^{th} dam mated to the J^{th} sire and e_{ijkl} : random error, iind (O, σ^2_e).

The data were analysed using the Mixed Model Least-Square Maximum Likelihood Computer Program (3). This method used Herdersons's Method 3 (4) to estimate the observable variance components (σ^2_s, σ^2_d, σ^2_e). This was done by equating computed mean squares with their expectations and solving for the components. The appropriate standard errors for the heritabilities were also computed by the LSML Computer Program (3).

Results and discussion

Means and standard errors of the growth traits studied are presented in table I. The analyses of variance show that whereas hatch effect was significant for body weight at 6 weeks ($p < 0.01$), the effect on shank length, keel length and breast width was not significant ($p > 0.01$). The results show a variation in the mean values for the various hatches, with body weight ranging from 92.93 to 191.43 gm, 3.24 to 4.01 cm for the shank length, 2.87 to 4.04 cm for keel length and 2.75 to 3.75 cm for the breast width. These variations may be due to genetic differences in the growth potentials of the experimental chicks. The estimates of heritability from the sire, dam and combined variance components for the various traits are presented in table II.

TABLE I Mean body weight, shank length, keel length and breast width of local chickens at six weeks.

Hatch N°	Body weight (g)	Shank length (cm)	Keel length (cm)	Breast width (cm)
1	191.43 ± 17.40	3.99 ± 0.22	4.04 ± 0.88	3.60 ± 0.24
2	130.79 ± 17.00	4.01 ± 0.21	3.14 ± 0.29	3.00 ± 0.24
3	173.69 ± 21.93	3.91 ± 0.28	3.28 ± 0.39	3.75 ± 0.30
4	103.93 ± 10.65	3.35 ± 0.14	3.10 ± 0.17	3.20 ± 0.16
5	92.93 ± 11.19	3.29 ± 0.14	3.28 ± 0.18	3.25 ± 0.17
6	108.65 ± 13.25	3.37 ± 0.17	3.37 ± 0.22	3.29 ± 0.19
7	135.75 ± 18.47	3.67 ± 0.23	3.75 ± 0.32	3.26 ± 0.25
8	100.31 ± 16.95	3.24 ± 0.21	2.87 ± 0.29	2.79 ± 0.40
Mean	114.97 ± 43.16	3.48 ± 0.49	3.35 ± 0.58	3.22 ± 0.54

TABLE II Heritability estimates of body weight, shank length, keel length and breast width of local chickens at six weeks.

Trait	h^2 s*	h^2 d*	h^2 s + d*
Body weight	0.41 ± 0.19	0.66 ± 0.29	0.36 ± 0.05
Shank length	0.58 ± 0.12	0.14 ± 0.05	0.36 ± 0.10
Keel length	0.34 ± 0.10	**	0.17 ± 0.06
Breast width	0.58 ± 0.22	0.36 ± 0.17	0.48 ± 0.11

** : ± standard error ; ** : negative heritability estimate.*
h^2 : heritability ; s : sire ; d : dam.

The estimates of heritability from the sire and dam are higher than those reported by other investigators (6, 7). The reason for the high estimates may be due to differences in the methods of analyses and estimations, the available number of observations, the statistical model used for the correction of the non-genetic factors and the sampling errors.

The estimate of heritability from the maternal variance component (h^2d) for body weight is higher than the value from the sire component (h^2s), indicating that body weight is subject to maternal, common environment and dominance influence. Similar trends have been observed in the Egyptian Fayoumi strain and the Nigeria local chicken (1, 6). On the other hand, estimates from the sire variance components for the shank length and the breast width are higher than estimates from the maternal variance components, indicating that these traits may be principally influenced by additive genetic effects. Hence, the theoretical consideration that the heritability estimates from the dam variance components are always higher than estimates from the sire variance components may not always be true in some practical situations.

Conclusion

In practice, the results show that there is a possibility of improving body weight, shank length, keel length and breast width of the Nigeria local chickens through intrapopulation selection.

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EBANGI (L.A.), IBE (S.N.). Heritability of growth traits in local chickens at 6 weeks in Nigeria. *Revue Élev. Méd. vét. Pays trop.*, 1994, **47** (2): 238-240

Six-week heritability estimates of body weight, shank length, keel length and breast width for the Nigerian local chickens were obtained with data from a nested model. 170 chicks of both sexes obtained from 5 sires, each mated with 4 dams by artificial insemination were used. On hatching, the chicks were wing-banded, pedigreed by sire and dam. Averages of these traits were 114.97 g, 3.48 cm, 3.35 cm and 3.22 cm for body weight, shank length, keel lenght and breast width, respectively. Heritability estimates from the sire, dam and combined variance components for body weight, shank length and breast width were 0.41, 0.66 and 0.36 ; 0.58, 0.14 and 0.36; 0.58, 0.36 and 0.48, respectively. Estimates for keel length from the sire and combined variance components were 0.34 and 0.17, respectively. The results show moderate to high heritabilites for these traits at 6 weeks.

Key words : Hen - Growth - Heritability - Weight - Body measurement - Artificial insemination - Nigeria.

L'insémination artificielle caprine au Rwanda. Adaptation à la chèvre rwandaise de la méthode utilisée pour les races laitières européennes

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Au Rwanda, 605 chèvres de race locale ont été inséminées sur œstrus induit par voie hormonale à partir d'un progestagène (FGA) imprégnant une éponge vaginale maintenue en place pendant 11 jours, associé à la PMSG et au cloprosténol injectés 48 h avant le retrait de l'éponge. Deux moments d'injection de la PMSG (48 h avant ou au retrait de l'éponge vaginale), deux doses de PMSG (200 ou 300 UI), et deux moments d'insémination (41 ou 45 h après le retrait de l'éponge), ont été testés. Les chèvres ont été inséminées par voie exocervicale une seule fois 41 ou 45 h après la fin du traitement progestatif avec une dose contenant 100 millions de spermatozoïdes conservés à l'état congelé. Le taux de fertilité moyen a été de 61,2 p. 100 (n = 605). Il a atteint 66,9 p. 100 pour 336 chèvres ayant reçu la PMSG 48 h avant le retrait de l'éponge vaginale. Le taux de prolificité, 2,14 en moyenne, a augmenté avec la dose de PMSG (200 UI : 2,05 ; 300 UI : 2,23 ; $p < 0,05$). Le taux de mortinatalité a été en moyenne de 13,3 p. 100 et était corrélé avec la prolificité ($r = 0,91$). Le passage à une dose de PMSG plus faible (100 UI) s'avère nécessaire pour réduire le taux de mortalité. Le moment d'insémination le plus favorable sera alors à déterminer.

Mots clés : Caprin - Chèvre Alpine - Chèvre Saanen - Insémination artificielle - Progestagène - Cycle œstral - Fertilité - Performance de reproduction - Rwanda.

Introduction

La population du Rwanda (7 millions d'habitants en 1993) croît d'environ 4 p. 100 par an, ce qui s'accompagne d'une diminution rapide des surfaces cultivables disponibles et d'une réduction de la taille moyenne des exploitations ne permettant plus l'entretien des bovins. Dans ce contexte, les caprins de la race rwandaise (environ 1,9 million de têtes en 1992), appartenant au groupe de chèvres naines de l'Afrique de l'Est, sont appelés à jouer un rôle important pour atteindre l'objectif d'autosuffisance alimentaire.

Dans le cadre des relations franco-rwandaises, le Projet de développement caprin (PRODELCA) de la zone de Kigali-Est a créé une structure chargée de développer la production caprine, en particulier par l'amélioration de la production de viande et de lait par croisement de la race locale avec la race Alpine française importée. Pour l'introduction et la diffusion rapide des gènes laitiers de cette race, les responsables du projet ont choisi 2 étapes. La

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Reçu le 23.9.1993, accepté le 14.6.1994.