a_2, a_3, a_4 and a_5 are the usual monomial symmetric functions in $p_1, p_2, p_3 \ldots\ldots p_k$. *viz.*, (1^2), (1^3), (1^4), and (1^5).

The above cumulants are linear expressions in a and b. The first and the second cumulants given in the previous papers are also linear in a and b. Hence γ_1 and γ_2 tend to zero when m and n tend to infinity, Therefore, when m and n tend to infinity, the distribution tends to the normal form.

Full details will be published in the *Journal of the Society of Agricultural Statistics.*

Indian Council of Agricultural Research, New Delhi, *November* 12, 1949.

P. V. KRISHNA IYER.

1. Krishna Iyer, P. V., *Nature*, 1947, **160**, 714.
2. —, *Ann. Math. Stat.*, 1950 (in the Press).

NUTRITIVE VALUE OF DUCK EGG WHITE

THE rachitogenic diet of Schneider and Steenbock (1939) in which hen egg white is the only source of protein, can sustain a fair degree of growth in rats, while inducing severe rickets in them within 2 to 3 weeks (Dikshit and Patwardhan, 1947). When duck egg white was substituted in the above ration, marked growth inhibition was noted in the animals together with the complete absence of any signs of rickets as shown in Table I.

TABLE I

Source of protein	Protein %	Ca/P	No. of Rats	Wt. in gm. (Average) Initial	Final	Diff.	Days on diet	Degree of rickets	Bone ash % (Average)
Hen egg White	16·1	23·8	6	52	60	+8	14	++++	29·7
Duck egg White	17·1	23·5	6	52	44	−8	14	Nil	39·0

Since the predisposing factor for the production of rickets on a rachitogenic diet is continued growth, it was felt that lack of growth observed in the animals on duck egg white was probably responsible for the absence of rickets in them. An explanation was, however, warranted for the inhibition of growth in the young animals on duck egg white. Two possibilities that suggested themselves were: (*i*) the poor nutritive quality of the duck egg white, and|or (*ii*) the presence of some toxic factor.

To decide the issue rats were kept on synthetic diets containing different levels of duck egg white protein. Control animals were kept on comparable levels of hen egg white protein. It was observed that on diets containing 8·4 and 15·5 per cent. duck egg white protein the average weight increase over eight weeks was 21 gm. and 41 gm. respectively whereas on hen egg white protein diets the increase was 65 gm. and 68 gm. respectively during the same period. The difference in food intake on the two diets was negligible. This experiment thus showed that the growth retardation or inhibition in rats on duck egg white could not be due to the presence of a toxic factor, since if such was the case, increased amounts of duck egg white in the diet would have caused a more pronounced adverse effect on growth than was seen at the lower levels.

The obvious inference that could be drawn was that the duck egg white protein had a lower nutritive value than the hen egg white protein on account of its (*i*) lower digestibility, and|or (*ii*) deficiency of one or more essential amino acids.

A few metabolic experiments were carried out on growing rats using the duck and hen egg white protein diets, to compare their respective digestibilities. The results showed that rats fed duck egg white excreted in fæces about 4 times as much nitrogen as the animals fed hen egg white diets at comparable levels of protein intake. The urinary nitrogen excretion was, on the other hand, considerably more in the animals fed the latter diets. In short, the duck egg white protein appeared to be much less absorbed by the rats than the hen egg counterpart.

These observations clearly show that the duck egg white has a lower nutritive value than hen egg white, the cause of which may be the low digestibility of the former. Further work is in progress and fuller details will be published elsewhere.

One of us (P.K.D.) wishes to express his grateful thanks to the Raptakos Medical