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Reproductive Performance of Quail on Purified Diets

G. D. Gackstetter, R. A. Nelson and C. W. Carlson¹

In recent years the value of quail as a potential research animal has become significantly realized. The Japanese quail (Coturnix coturnix japonica) has been used mostly because of its high degree of individual uniformity and high reproductive efficiency. They are also inexpensive to maintain and have a short life cycle, which is a great advantage in most research work. In previous studies at this laboratory, quail have shown poor reproductive performance on a purified diet. The diet was of the glucose-isolated soybean protein type supplemented with the essential minerals and vitamins.

For this present work, it was decided to compare a glucose-casein diet with the glucose-isolated soy diet in the first study and in a second study the same treatments were used with and without an alfalfa supplement. A practical corn-wheat-soybean meal diet was also fed to a control group of quail in the first experiment. Observations made were body weight changes, feed intake, egg production, fertility and hatchability of eggs set. Seven females and two males just attaining sexual maturity were used per pen, with four pens on each diet for the first experiment. The second and third studies were conducted with two pens on each diet, using eight females and two males per group.

The results shown in Table 1 illustrate among other things what had been observed before, that the glucose-isolated soy diet supported suboptimal egg production and very poor fertility and hatchability. The glucose-casein diet supported about the same type of suboptimal egg production, but eggs laid by quail on this diet showed greatly improved fertility and hatchability. Still, the latter were inferior to the type of performance observed with eggs from quail fed the practical diet.

In the second experiment, the 2% alfalfa meal supplement improved egg production, fertility and hatchability on both types of diets. For some unknown reason the fertility and hatchability in the second study as compared to the first appeared to be slightly higher for eggs from quail fed the glucose-isolated soy diet but much lower for those receiving the glucose-casein diet. Feed intake was slightly less on the glucose-casein diet, but both purified diets were not consumed as well as the practical diet.

In the third experiment, the positive responses from alfalfa meal were again noted. Fish meal showed a production response, whereas all parameters were superior with the practical diet.

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These studies show that the poor performance may have been in part due to the reduced palatability of the purified diets as noted by the reduced feed intake. However, the purified diets were lacking also in a required factor(s) supplied to some extent by the alfalfa meal.

Table 1. Effects of Alfalfa Meal and Purified Diet Types on Quail Performance

Diet and treatment	Body wt. at end gm	Gm feed/ bird/day	Egg prod. (H-D %)	Egg wt. gm	Fertility %	Hatch of all eggs %
<u>Experiment 1</u>						
1. Glucose-isolated soybean protein ¹	129	16.9	51.9	8.4	11.2	1.8
2. Glucose-casein ¹	124	15.6	55.4	8.9	67.9	47.2
3. Practical	130	23.9	74.4	9.7	77.0	62.7
<u>Experiment 2</u>						
1. Glucose-isolated soybean protein	130	18.9	47.9	9.6	15.4	4.9
2. As 1 + 2% alfalfa meal	132	18.5	56.2	9.6	19.3	10.2
3. Glucose-casein	130	16.0	42.3	8.9	29.5	16.2
4. As 3 + 2% alfalfa meal	126	16.7	64.0	9.1	44.4	24.6
<u>Experiment 3</u>						
1. Glucose-isolated soybean protein	144	17.3	26.0	9.2	16.0	1.7
2. As 1 + 1% fish meal	142	19.0	44.0	9.2	21.0	1.1
3. As 1 + 2% alfalfa meal	141	18.2	49.0	9.1	30.0	7.9
4. Practical	143	23.6	64.7	10.5	70.0	49.8

¹All diets were supplemented with the recommended minerals and vitamins. Energy was supplied by glucose and the amino acids by either soy protein and methionine or casein and glutamic acid.