

A Comparison Between Pelleted and Mash Feeding for Growing Chicks

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SIXTEEN hundred chicks of New Hampshire and Plymouth Rock were used from December and April hatches. Half of each group received pellets while the other half received mash feeding. Average body weights were better in chicks fed pelleted ration in almost all periods of age, breeds and seasons. The results obtained for gain showed similar trends as that of actual body weight. As regards growth rate, pellet fed birds had a tendency to accelerate growth rate at later ages over mash fed ones.

Pellet feeding gave better feed conversion than mash feeding for both breeds and seasons. New Hampshire had better conversion rate than the Plymouth nearly at all ages of life. April hatch had a lower feed efficiency than December hatch. Best conversion was attained at earlier stages of life specially for pellet feeding. Pellet fed birds showed less mortality than mash fed birds at all ages. The first period of life had the highest mortality rate. Mortality rate declined markedly after the fourth week of age in the December hatch rather than April one.

Hammond and Stephenson (1959) recommended the use of pellet feeding for growing chicks as they encourage the growth rate, over other types of feeding. However, Jensen *et al.* (1965) showed that with adequate levels of proteins, pelleting did not improve the growth rate of turkeys, but feed efficiency was consistently improved. Also, chicks fed pelleted rations gained more weight and consumed less feed than chicks fed unpelleted rations (Hoie and Sannor, 1961). Bearse *et al.*, (1952), found that feather picking commenced at an early age and was more severe in the pelleted fed pens and caused higher mortality. However, Lanson and Smyth (1954), when comparing pellets, mash and a combination of the two found that mortality was very low and there was no evidence of cannibalism or feather picking in all treatments.

Material and Methods

Sixteen hundred chicks of both New Hampshire and White Plymouth Rock breeds were used. They were hatched in December and April. Two types of feeding were used. The chicks were divided to eight groups of 200 chicks each. They were wing banded and vaccinated against New Castle; chicks were brooded until 3 weeks in batteries then transferred to floor brooders until the 12th week of age. One half of them was fed a mash broiler ration as follows :

They started with a starting ration of 19.09% crude protein, 915 metabolizable energy (Kcal./Lb.) and 687 productive energy (Kcal./Lb.). Then they were fed a finishing ration from 9 to 12 weeks of age containing 21.24% crude protein, 962 metabolizable energy (Kcal./Lb.) and 711 productive energy (Kcal./Lb.). The other half of the chicks were fed pellets of the same composition as used in mash diets. Pellets of $\frac{3}{8}$ and $\frac{3}{16}$ inch in diameter were used for the starting and finishing diets respectively. Body weights were recorded bi-weekly for each individual along with feed efficiency and mortality rate.

Results and Discussion

Absolute body weight

The general means for body weights were in favour of chicks fed pelleted ration during nearly all periods (Table 1). At 12 weeks of age the mash fed birds were lighter by over 150 grams in the December hatch than the pelleted-fed groups. This difference was not so pronounced in the April hatch; where the pellet fed groups showed an increase of about 30 grams. These results may be due to the fact that pelleting holds together all the feed ingredients more than in mash rations. Similar results were also observed by Hammond and Stephenson (1959). The differences due to type of feeding and seasons were found to be highly significant (Table 2), at 8 and 12 weeks of age. Breeds differed also, with less degree in this respect.

Absolute gain

For the first season of brooding, results favoured pelleted feeding over mash feeding for the two breeds. In the April hatch, some age intervals showed somewhat increase in gain for the mash fed than the pelleted feed, especially at 8 - 12 weeks of age. December hatched chicks showed their highest gain during the early ages, while the April hatched ones showed their highest gain during the later ages.

Relative rate of growth

December hatched birds grew faster than the April hatched ones. The pellet fed groups seemed to have a tendency for accelerated growth at later ages than did the mash fed groups. This may be the cause of high growth rate of pelleted fed groups than the mash fed ones. The two breeds differed in their response to the treatment. Plymouth chicks showed their highest response to pellet feeding in December hatch while the New Hampshire showed their highest response to pellet feeding in the April hatch.

TABLE 1. Absolute weight in grams at bi-weekly intervals for the New Hampshire and White Plymouth Rocks fed pellets and mash in the two rearing seasons.

Season	Age in weeks	Pellets			Mash		
		New Hampshire	White Plymouth R.	Mean	New Hampshire	White Plymouth R.	Mean
1st season . .	H	40	41	40.5	40	41	40.5
	4	263	259	261	228	207	217
	8	599	502	581	484	455	467
	10	737	728	733	601	598	600
	12	882	894	886	738	721	730
2nd season . .	H	38	39	38.5	38	39	38.5
	4	193	202	198	184	187	186
	8	507	554	531	484	470	477
	10	654	651	563	577	685	681
	12	949	903	926	875	910	898

TABLE 2. Analysis of variance of absolute body weights at 8 and 12 weeks of age for the feeding trials.

Age in weeks	Source of variation	Degrees of freedom	Mean square	F Value
8	Ration (R) . . .	I	2,608,026	214.17**
	Season (S) . . .	I	906,145	74.41**
	Breed (B)	I	155,021	12.75**
	R × S	I	129,485	10.63
	R × B	I	17,669	1.45
	S × B	I	150,617	12.37
	R × S × B . . .	1305	12,177	—
Total		1311	—	—
12	Ration (R) . . .	I	5,158,654	179.55**
	Season (S) . . .	I	1,305,942	45.55**
	Breed (B)	I	102,987	3.59
	R × S	I	335,571	11.71**
	R × B	I	9,517	.33
	S × B	I	79,182	.27
	R × S × B . . .	1193	28,697	—
Total		1199	—	—

(**) Highly significant.

Feed efficiency

In general, pellet feeding seemed to have better feed conversion values than mash feeding (Table 3). The feed efficiency figures were somewhat larger in April hatch, indicating lower feed conversion than in December hatch. It was apparent at various cases that pellets seemed to be more advantageous when feeding conditions were harder for birds, high fiber content, less energy content or less protein level. It was suggested that pelleting brings about some changes in the physical form and density of the ration, along with some chemical changes, that affect primarily the gain in protein ratio of the diet (Allerd *et al.*, 1956). The best feed conversions were gained earlier in the life specially with pellet feeding. New Hampshire chicks showed better feed efficiency with pellets than the New Hampshires.

TABLE 3. Relative rate of growth at four weeks intervals for pellet versus mash feeding by breeds and seasons of rearing.

Season	Age in weeks	Pellets			Mash		
		New Hampshire	White Plymouth R.	Mean	New Hampshire	White Plymouth R.	Mean
1st season	H-4	147.2	143.3	145.3	123.1	133.9	128.5
	4-8	81.9	73.8	77.8	71.9	74.5	73.2
	8-12	38.2	45.6	41.9	41.6	45.7	43.7
2nd season	H-4	134.2	135.3	134.8	131.5	131.0	131.3
	4-8	118.3	93.1	105.7	89.8	96.4	93.1
	8-12	59.6	60.3	60.6	50.3	78.3	79.3

TABLE 4. Feed efficiency at four weeks intervals and cumulated in pellet versus mash feeding for the New Hampshire and White Plymouth Rock in December and April hatches.

Seasons	Age in weeks	Pellets			Mash		
		New Hampshire	White Plymouth R.	Mean	New Hampshire	White Plymouth R.	Mean
1st seasons	H-4	2.87	2.91	2.89	3.14	3.15	3.14
	4-8	3.06	3.11	3.09	3.32	3.37	3.35
	8-12	4.27	4.09	4.18	4.39	4.17	4.28
	H-8	3.47	3.62	3.54	3.75	3.68	3.72
	H-12	3.19	3.27	3.25	3.41	3.42	3.41
2nd season	H-4	3.07	3.12	3.10	3.72	3.31	3.47
	4-8	3.19	3.21	3.20	3.62	3.42	3.52
	8-12	4.19	4.32	4.25	4.26	4.46	4.36
	H-8	3.62	3.57	3.60	3.89	3.76	3.83
	H-12	3.27	3.44	3.36	3.62	3.79	3.70

Mortality rate

Pellet fed birds showed less mortality than the mash fed ones. The first 2-weeks mortality was relatively higher in December hatch, especially with the New Hampshire probably due to inadequate heating system (Table 5). This was observed in mash and pellet feeding. However, April hatch showed more mortalities, probably due to feather picking and aggressive tendencies, than the December hatches. This was more apparent in pellet feeding, a fact which confirms the finding of Steward and Upp, (1950).

TABLE 5. Mortality percent at bi-weekly intervals for pellet versus mash feeding of the New Hampshire and Plymouth Rock in the two seasons of rearing

Seasons	Age in weeks	Pellets			Mash		
		New Hampshire	White Plymouth R.	Mean	New Hampshire	White Plymouth R.	Mean
1st season	H-2	6.5	2.0	4.3	11.5	5.0	8.3
	2-4	0.5	0.0	0.3	1.5	3.0	2.3
	4-6	2.0	5.5	3.8	1.5	0.0	0.8
	6-8	2.0	1.0	1.5	0.5	1.5	1.0
	8-10	2.0	1.0	1.5	0.5	3.0	1.7
	10-12	0.0	0.5	0.3	0.0	0.0	0.0
	H-12	13.0	10.0	12.0	15.5	12.5	14.0
2nd season	H-2	2.5	3.5	3.0	3.0	4.0	3.5
	2-4	6.5	7.0	7.0	6.0	5.0	5.5
	4-6	1.5	2.0	3.7	2.5	4.0	3.3
	6-8	1.5	1.5	1.5	2.5	2.0	2.3
	8-10	6.0	5.0	5.5	4.0	5.0	4.5
	10-12	2.5	2.0	2.3	3.0	2.0	2.5
	H-12	20.5	21.0	20.8	21.0	22.0	21.5

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مقارنة بين تأثير التغذية على المكعبات والمخلوط الناعم على النمو في الكتاكيت

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استعمل في هذه الدراسة ١٦٠٠ كتكوت من نوعى النيوهامشير والبلابيموث
الابيض الفاقسة في شهرى ديسمبر وابريل . وقسمت قسمين غذى كلاهما
بعليقة تتفق في التركيب الغذائى ولكن تختلف من حيث الشكل . فالقسم
الاول تناولها مكعبات والنصف الثانى تناولها على هيئة مخلوط ناعم .

وقد وجد ان جميع المتوسطات لاوزان الجسم كانت افضل في التغذية
على المكعبات في جميع الاعمار والانواع والمواسم . وقد اعطت متوسطات
الزيادة في الوزن نفس الاتجاه مع وزن الجسم الكلى .

وبالنسبة لسرعة النمو وجد ان جميع الطيور المغذاة على مكعبات تسرع من
النمو وخاصة في الفترة الاخيرة من العمر عن التى تناول الغذاء كمخلوط
ناعم .

كذلك وجد ان التغذية على مكعبات اعطت كفاءة تحويلية للغذاء احسن من
التغذية الناعمة . وكان النيوهامشير احسن في كفاءة التحويل للغذاء في
جميع الاعمار عن البلابيموث كما كانت الكتاكيت الفاقسة في ديسمبر اكفأ في
التحويل الغذائى من التى فقست في ابريل . وكان التحويل الغذائى اكفا
ما يمكن في الاعمار الصغيرة وخاصة عند التغذية على المكعبات .

وانخفضت نسبة التفرق في التغذية على المكعبات في المخلوط الناعم كما
كانت الاعمار الصغيرة اكثر تعرضا للتفوق . وقل التفوق كلما كبرت الكتاكيت
وخاصة في فقس ديسمبر .