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The Effect of Early Feed Restriction on Subsequent Performance of Two Commercial Broiler Strains

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ABSTRACT. Growth, feed intake, feed to gain ratio, and abdominal fat was evaluated in Hubbard and Shaver broilers subjected to early feed restriction using a complete practical diet. The design consisted of 3 feeding regimens: the ad libitum feeding (C), medium restriction (MR), and severe restriction (SR). Feed restriction was imposed during the second and third weeks of age and was followed by ad libitum feeding to the age of 7 or 8 weeks.

In all restricted fed birds, weight gain during the refeeding period was sufficiently high to compensate fully for growth retardation during the restriction period. Final body weights of restricted-fed birds were not statistically different from their ad libitum-fed controls. These data demonstrate that the broiler chicken has the ability for compensatory growth when ad libitum feeding follows early feed restriction. Total feed intake was significantly reduced with the increase in feed restriction. No significant differences were found between the two broiler strains for all parameters studied.

Females had significantly higher abdominal fat percentages over the males for both strains of birds. However, these sex differences within each age period were statistically indistinguishable. An overview of these results suggests that early feed restriction has no deleterious effect upon final body weights at 7 or 8 weeks of age.

Economic considerations such as high feeding cost and/or excess deposition of abdominal fat in fast growing broilers, continue to stimulate interest in feed restriction regimens. Restricted feeding in broilers has been practiced by allowing the birds less time for access to food, by using low energy and/or low protein diets, by skip-a day feeding and by quantitative feed restriction.

Wilson (1977) assumed that birds fed ad libitum were capable of maximum growth.

Wilson and Osborn (1960) concluded that compensatory growth may be obtained after short periods of restriction whereas longer periods diminish recovery and may result in a delay in achieving normal weights or even cause permanent stunting of the animal.

The existence of compensatory growth in broilers, following feed restriction, however, remains controversial (Reid and White 1977). This is partly due to conflicting results or variable experimental conditions. Another likely cause of the controversy is the difference in our understanding of the definition of the term itself. Washburn and Bondari (1978) found little evidence for compensatory growth when feed was restricted for 3 to 5 weeks in 3-8 week old broilers. However they reported earlier that short periods of feed access actually served as a stimulus to consumption, resulting in an increased body weight (Washburn and Bondari 1977). McCartney and Brown (1977) showed that restricting feeding time for broilers by 15 min for every 2 hr. had no adverse effect on 8-week body weights but consistently produced better feed conversions than full fed controls. Even better feed conversions were obtained when feed was limited to 15 min. out of every 4 hr., but 8-week weights were significantly depressed.

Plavnik and Hurwitz (1985) stated that early severe energy restriction resulted in a somewhat reduced body weight at marketing age of 7 to 9 weeks but considerably improved feed efficiency. Other investigators reported that broilers are capable of compensatory growth (Griffths *et al.* 1977a, Moran 1980).

Studies dealing with fat deposition revealed that what and how broiler chicks are fed during the first few days of life might influence the relative deposition of abdominal fat in broilers (Hargis and Cregey 1980, Maurice *et al.* 1982, Plavnik and Hurwitz 1985, Jensen *et al.* 1987).

Becker *et al.* (1979) found that abdominal fat weight is a good indicator of total, carcass, and intestinal fat. Both strain and sex have a greater effect on abdominal fat deposition in broilers than dietary energy level (Nordstrom *et al.* 1978). Leenstra and Pit (1987) and Deaton *et al.* (1983) reported that male broilers were heavier and with less abdominal fat and better feed conversion than females ($P \leq .01$).

In early life, increased adipocyte cell numbers rather than their size was the predominant factor affecting the size of adipose depot in the sexually mature animal (Hirschand and Han 1969, Johnson *et al.* 1971, Greenwood and Hirsch 1974).

This study was designed to study the effects of two levels of early feed restriction upon subsequent performance of two commercial broiler strains.

Materials and Methods

Hubbard and Shaver broiler chicks were obtained from a commercial hatchery located in Riyadh area. On the day of hatch, 243 unsexed chicks from each strain were wing banded, individually weighed and randomlly alloted to 9 electrically heated battery pens representing 3 experimental groups each of 3 pens. The different experimental groups were randomly assigned to one of the following dietary treatments: Treatment 1 was based on ad libitum feeding for the whole experimental period and was considered as an ad libitum-fed control (C), treatment 2 was based on medium feed restriction of approximately 76% and 85% of the ad libitum-fed control during the second and third weeks of age, respectively (MR), and treatment 3 (severe restriction) consisted of 69% and 75% feed restriction of ad libitum-fed control during the second and third weeks of age, respectively (SR). Feeding consisted of a commercial starter crumble diet containing 22% crude protein and providing 3146 Kcal ME/Kg for the first 4 weeks and a pelleted finisher diet containing 20% protein and providing 3190 Kcal ME/Kg for the remaining four weeks (Table 1). At 2 weeks of age all the different experimental groups were randomly placed in 18 floor pens of an environmentally controlled house where the average house temperature was 22°C. Floor pens were provided with wheat straw litter, 2 hanging feeders and an automatic waterer. Birds were reared under continuous lighting regimen and received water ad libitum during the entire experimental period.

Table 1. Composition of starter and finisher diets*

Nutrient	Starter	Finisher
Crude protein %	22.00	20.00
Crude fat %	5.30	5.30
Crude fiber %	3.00	3.00
Calcium %	0.90	0.90
Phosphorus %	0.70	0.62
Salt %	0.35	0.35
ME, Kcal / Kg	3146	3190

* Manufactured by: Grain Silos and Flour Mills Organization, Riyadh.

Ingredients used in the starter and finisher diets are the following:

Yellow Corn, Alfalfa Meal, Soyabean Meal, Meat and Bone Meal, Fish Meal, Animal Fat, Salt, Calcium Carbonate, Dicalcium Phosphate, Manganese, Selenium, Iron, Copper, Iodine, Zinc, Methionine, Vitamins A, E, D3, K, Thiamine, Riboflavin, Niacin, Pantothenic Acid, Folic Acid, Biotin, Choline Chloride, B12, Ethoxyquin, Fermentation Products.

Contains: COBAN for the prevention of coccidiosis and 3 NITRO 10% for growth promotion.

Individual body weights and feed consumption by pen were measured weekly except for the fifth week's body weights. Weight gain and feed to gain ratio were determined.

At 7 weeks of age, 9 birds (males & females)/treatment/strain were randomly selected and sacrificed for carcass measurements. Feed was removed from the birds before scarificing time. After evisceration the carcass and abdominal fat weights were determined for males and females. At 8 weeks of age, another sample of 12 birds (males and females)/treatment/strain was sacrificed for similar measurements. Abdominal fat weights were expressed as percentage of live body weight. Abdominal fat was the fat surrounding the gizzard and extending within the ischium and surrounding the bursa of fabricus, cloaca and adjacent abdominal muscles.

Comparisons were made between treatments on the basis of growth rate, feed intake, feed to gain ratio and abdominal fat.

Statistical Analysis. The data were subjected to statistical analysis, King Saud University Computer Center, using general linear model procedure, SAS User's Guide (1986) according to the following models:

$$Y_{ij} = U + T_i + e_{ij}$$

where Y_{ij} is the 1^{st} observation of the i^{th} treatment. U is the general mean and e_{ij} is the random error associated with Y_{ij} observation,

$$Y_{ijkl} = U + T_i + A_j + S_k + (TA)_{ij} + (TS)_{ik} + (AS)_{jk} + (TAS)_{ijk} + e_{ijkl}$$

where Y_{ijkl} is the 1^{st} observation of the i^{th} treatment, j^{th} age and k^{th} sex. U is the general mean and e_{ijkl} is the random error associated with Y_{ijkl} observation and

$$Y_{ijk} = U + A_i + B_j + (AB)_{ij} + e_{ijk}$$

where Y_{ijk} is the 1^{st} observation of the i^{th} age and j^{th} strain. U is the general mean and e_{ijk} is the random error associated with Y_{ijk} observation.

Results and Discussion

Mean body weight gains, feed intake, feed to gain ratios and final body weights are shown in Table 2.

Weight gain. Weight gain was significantly ($P \leq .01$) reduced in all restricted groups (MR and SR) of both strains, during the second and third weeks of age compared with the ad libitum-fed controls. The reduction occurred stepwise with the severity of restriction being more pronounced in the SR groups. However, both groups of birds subjected to feed restriction exhibited compensatory growth when switched to ad libitum feeding during the fourth week. The weight gain of the two restricted groups, during the first week of refeeding (3-4 weeks of age), exceeded significantly ($P \leq .01$) that of the controls. During the next biweekly period (4-6 weeks) weight gain did not favour any treatment. The relatively low weight gain for the restricted fed groups during this age period (4-6 weeks) might be due partly to the nutrition change from starter to finisher ration. From 6 to 7 weeks of age, weight gain of the restricted fed birds was significantly higher ($P \leq .01$) than their ad libitum-fed controls. Starting at 7 weeks of age, no treatment differences were noted except for the Hubbard MR birds whose weight gain significantly ($P \leq .01$) exceeded that of the controls and the SR birds. This might suggest that, under the conditions of this experiment, almost a complete compensation occurred before the seventh week of age. Barnes and Miller (1981) reported that compensation for the earlier loss in weight gain of such birds during the refeeding period was indicative of normal cell functioning (Protein synthesis) during the latter period.

Body weight. The accelerated growth rate of the restricted-fed birds was sufficiently high to compensate entirely for the growth loss during the 2 weeks period of feedrestriction, during a growth period of 7 or 8 weeks.

Final body weights of restricted fed-birds were not statistically different from their ad libitum-fed controls (Table 2). These data clearly demonstrate that broiler chickens have the ability for compensatory growth when ad libitum feeding follows early feed restriction, regardless of the level or restriction used.

The ability of animals to compensate of undernutrition has been reviewed by Willson and Osbourn (1960). Other investigators indicated that broilers are able to compensate for growth loss resulting from energy restriction up to 2233 ME/Kg of starter diet for the first 3 weeks of age (Griffths *et al.* 1977), short term periods of restriction of feed access (Washburn and Bondari 1977) and for protein restriction 22% CP diet during the first 2 weeks of age (Moran 1980). However it seems that the ability of broilers to compensate for growth loss depends on several factors including nature, severity and duration of restriction program, diet and age of birds.

Feed intake. In general, there was a trend towards a significant reduction in the overall feed intake (1 to 7 and 1 to 8 weeks) with increased feed restriction (Table 2). Exceptions to this were the highly significant ($P \leq .01$) increase in the 1 to 7 weeks intake for the Shaver MR treatment in comparison with SR treatment and the highly significantly ($P \leq .01$) increase in feed intake of the Shaver MR birds (1-8 weeks) over controls and SR birds. Because of this, the final body weights of the MR Shaver birds slightly exceeded that of other treatments, however the difference was nonsignificant. Differences in feed intake among treatments were more pronounced than those in feed to gain ratio. It is worth noting that feed restriction was imposed by quantitative feed restriction of a complete practical diet. Thus it seems, that feed restriction causes a reduction in feed consumption without sacrificing body weights, and hence early feed restriction should be considered in broiler production operations.

Feed to gain ratio. Although compensatory adjustment occurred in all birds subjected to feed restriction, a statistically improved feed to gain ratio, typical of this activity was not indicated. The only exception was the MR Hubbard chickens which were significantly ($P \leq .01$) improved compared with the controls during the 1-8 week period (Table 1). Similar patterns have been shown by Marks (1979) and Mollison *et al.* (1984) who found that the net result of feed restrictions for relatively short periods, was that overall feed conversion was not different between ad libitum fed and restricted fed birds.

Body characteristics. A primary objective of this investigation was to study the effect of early feed restriction on abdominal fat deposition. Final body weights of restricted fed-males and females, from both strains of birds, slaughtered at 7 or 8 weeks of age were not significantly different from that of ad libitum fed controls (Tables 3 and 4). An exception was the SR Hubbard males which showed significantly ($P \leq .05$) lower body weights at 8 weeks of age, compared with the MR birds. This is in agreement with the results reported by Plavnik and Hurwitz (1985). Carcass weights showed a similar pattern as they were not influenced by early feed restriction. However, carcass weight of the SR Hubbard males slaughtered at 7 week of age was significantly ($P \leq .05$) less than those of the controls.

Male chickens from both strains were heavier and had less abdominal fat than females. The overall average of body and carcass weights of males, within each age period, was highly significant ($P \leq .01$) than that of females (Tables 3 and 4). This is in agreement with results obtained by Leenstra and Pit (1987).

Within each age period, females from both strains had a significantly higher percentage of abdominal fat than males. Similar results have been documented previously (Deaton *et al.* 1983, Leenstra and Pit 1987).

Abdominal fat percentages of the different treatments, for each sex and within each age period, were statistically indistinguishable (Tables 3 and 4). However, abdominal fat percentage of the 7 week Shaver females significantly ($P \leq .05$) exceeded that of their controls, and the 8 week Shaver MR females significantly ($P \leq .05$) exceeded that of the SR females. These findings are in contrast with the results obtained by Plavnik and Hurwitz (1985) who reported that abdominal fat at 8 weeks was significantly reduced by feed restriction for durations of 6, 10 and 14 days of age. It is possible that the degree of feed restriction used in this study was insufficient to reduce adipocyte proliferation or that if such an effect did occur it was nullified by adipocyte hypertrophy when adequate amounts of feed was offered during the refeeding period. Cartwright *et al.* (1986) reported that the problem of excessive fat deposition in broiler selected stocks was apparently related to factors which affected adipocyte hypertrophy or body composition and not adipocyte hyperplasia.

Results concerning the effects of age on abdominal fat deposition are presented in Table 5. As a percent of body weight, there was as much abdominal fat in broilers at 7 weeks of age as there was at 8 weeks.

Effect of strain. No significant differences were found between the two strains of broilers for all parameters studied (Table 6). However the Hubbard chickens showed a slightly higher value over that of Shaver chickens. Summers and Leeson (1979) reported similar results, namely no significant differences in visceral and abdominal fat between four strains in 8 week old broilers. On the other hand, Cherry *et al.* (1978) found that early growth restriction increased abdominal fat in two of four other strains studied and decreased the adipose tissue in the other two. These results coupled with our present data raised question on a possible genetical involvement in abdominal fat development.

Mortality. Mortality among both strains of broilers was relatively low, and most of it occurred after 5 weeks of age and could be attributed to leg disorders in general. The eight chickens that died from each strain, during the whole experimental period appeared to have been at random among the treatments. Hence, it seems that mortality was not influenced by feed restriction.

Table 2. Performance of Hubbard and Shaver non sexed broiler chickens subjected to early fed restriction

Traits	Strain					
	Hubbard			Shaver		
	C	MR	SR	C	MR	SR
Body weight/g						
1 week	148 ± 1.25[a]	148 ± 1.25[a]	147 ± 1.25[a]	141 ± 1.54[a]	142 ± 1.54[a]	141 ± 1.54[a]
Weight gain						
1-2 weeks	163 ± 1.50[a]	110 ± 1.50[b]	96 ± 1.50[c]	166 ± 2.50[a]	109 ± 2.50[b]	97 ± 2.50[c]
2-3 weeks	259 ± 2.71[a]	230 ± 2.80[b]	207 ± 2.80[c]	256 ± 4.30[a]	229 ± 4.30[b]	203 ± 4.30[c]
3-4 weeks	374 ± 5.69[a]	410 ± 5.71[b]	422 ± 5.73[bc]	348 ± 8.60[a]	404 ± 8.60[b]	405 ± 8.60[bc]
4-6 weeks	893 ± 15.00[a]	873 ± 15.00[a]	869 ± 15.20[a]	875 ± 20.40[a]	878 ± 20.40[a]	839 ± 20.70[a]
6-7 weeks	280 ± 10.20[a]	330 ± 10.10[c]	349 ± 10.20[bc]	221 ± 16.00[a]	338 ± 16.10[b]	310 ± 16.30[bc]
7-8 weeks	334 ± 12.80[a]	383 ± 12.10[b]	340 ± 12.50[a]	346 ± 21.50[a]	347 ± 21.20[a]	348 ± 21.70[a]
Body weight/g						
7 weeks	2098 ± 25.39[a]	2092 ± 25.56[a]	2096 ± 26.06[a]	2008 ± 36.00[a]	2096 ± 36.20[a]	2007 ± 36.70[a]
8 weeks	2430 ± 30.56[a]	2484 ± 29.89[a]	2435 ± 30.56[a]	2384 ± 43.10[a]	2456 ± 42.50[a]	2367 ± 43.40[a]
Feed intake/g						
1-7 weeks	4271 ± 11.40[a]	4012 ± 11.50[b]	4091 ± 11.70[c]	4081 ± 17.20[a]	4124 ± 17.80[a]	3958 ± 17.50[b]
1-8 weeks	5289 ± 15.10[a]	5099 ± 14.60[b]	5190 ± 15.00[c]	5170 ± 17.70[a]	5258 ± 17.50[b]	5054 ± 17.90[c]
Feed to gain ratio						
1-7 weeks	2.15 ± 0.04[a]	2.14 ± 0.04[a]	2.06 ± 0.05[a]	2.26 ± 0.05[a]	2.16 ± 0.05[a]	2.18 ± 0.05[a]
1-8 weeks	2.33 ± 0.04[a]	2.20 ± 0.04[b]	2.25 ± 0.04[ab]	2.35 ± 0.05[a]	2.32 ± 0.05[a]	2.34 ± 0.05[a]

[a,bc] Means within measurements and within strain with different letters are significantly different ($P \leq .01$)

[1] Abbreviations: C, control; MR, 76% and 85% restriction of the control during 2nd and 3rd week, respectively; SR, 75% and 69% restriction of the control during 2nd and 3rd week, respectively.

Table 3. Effect of early feed restriction on some body characteristics of male and female Hubbard chickens slaughtered at 7 and 8 weeks of age

Treatments	Body weight (g)				Carcass weight (g)				Abdominal fat/BW (%)			
	7 week		8 week		7 week		8 week		7 week		8 week	
	M	F	M	F	M	F	M	F	M	F	M	F
C	2469[a] ±107.7 (5)	1880[a] ±120.4 (4)	2742[ab] ± 98.3 (6)	2347[a] ± 98.3 (6)	1833[a] ±75.2 (5)	1347[a] ±84.2 (4)	1992[a] ±68.0 (6)	1682[a] ±68.6 (6)	3.05[a] ±0.32 (5)	3.62[a] ±0.36 (4)	3.86[a] ±0.29 (6)	3.78[a] ±0.29 (6)
MR	2441[a] ±107.7 (5)	1923[a] ±120.4 (4)	2803[a] ±107.7 (5)	2288[a] ±910 (7)	1796[ab] ±75.2 (5)	1378[a] ±84.1 (4)	2053[a] ±75.2 (5)	1666[a] ±63.5 (7)	3.29[a] ±0.52 (5)	3.26[a] ±0.36 (4)	3.03[a] ±0.32 (5)	4.31[a] ±0.27 (7)
SR	2252[a] ± 98.3 (6)	1949[a] ±139.0 (3)	2507[b] ± 85.0 (8)	2171[a] ±120.4 (4)	1609[b] ±68.6 (6)	1358[a] ±97.1 (3)	1926[a] ±59.4 (8)	1583[a] ±84.1 (4)	2.76[a] ±0.29 (6)	4.29[a] ±0.41 (3)	3.61[a] ±0.25 (8)	3.72[a] ±0.36 (4)
Overall average	2387 ±60.4	1917** ±73.3	2684 ±56.3	2268** ±60.0	1746 ±42.2	1361** ±51.2	1990 ±39.3	1644** ±41.9	3.03** ±0.18	3.71 ±0.22	3.50 ±0.17	3.94 ±0.18

[abc] Means within a column followed by a common letter are not significantly different ($P \leq .05$).

Overall average of males and females within each age period having an astrisk are significantly different * ($P \leq .05$) ** ($P \leq 0.01$).

[1]See footnote 1. table 2.

Values in parantheses denote number of birds.

Table 4. Effect of early feed restriction on some body characteristics of male and female Shaver chickens slaughtered at 7 and 8 weeks of age

Treatments	Body weight (g)				Carcass weight (g)				Abdominal fat/BW (%)			
	7 week		8 week		7 week		8 week		7 week		8 week	
	M	F	M	F	M	F	M	F	M	F	M	F
C	2276^{a} ± 99.0 (5)	1822^{a} ±110.7 (4)	2649^{a} ± 83.7 (7)	2361^{a} ± 99.0 (5)	1685^{a} ±82.4 (5)	1347^{a} ±92.1 (4)	1947^{a} ±69.6 (7)	1727^{a} ±82.4 (5)	2.71^{a} ± .28 (5)	3.09^{a} ± .24 (4)	2.93^{a} ± .24 (7)	4.36^{ab} ±0.28 (5)
MR	2317^{a} ±110.7 (4)	1841^{a} ± 99.0 (5)	2534^{a} ±110.7 (4)	2198^{a} ± 78.3 (8)	1700^{a} ±92.1 (4)	1327^{a} ±82.4 (5)	1855^{a} ±92.1 (4)	1609^{a} ±65.1 (8)	3.45^{a} ±0.31 (4)	4.18^{b} ± .28 (5)	3.29^{a} ± .31 (4)	4.40^{a} ± .22 (8)
SR	2214^{a} ±110.7 (4)	1813^{a} ± 99.0 (5)	2748^{a} ± 78.3 (8)	2132^{a} ±110.7 (4)	1616^{a} ±92.1 (4)	1319^{a} ±82.4 (5)	2022^{a} ±65.1 (8)	1589^{a} ±92.1 (4)	3.28^{a} ± .22 (4)	3.73^{ab} ± .28 (5)	3.28^{a} ± .22 (8)	3.55^{b} ± .31 (4)
Overall average	2269 ±61.8	1826** ±59.5	2644 ±53.1	2230** ±56.0	1667 ±51.4	1331** ±49.5	1941 ±44.2	1641** ±46.6	3.15* ± .18	3.67 ± .17	3.16 ± .15	4.1 ± .16

^{abc} Means within a column followed by a common letter are not significantly different ($P \leq .05$).

*Overall average of males and females within each age period having an astrisk are significantly different * ($P \leq .05$) ** ($P \leq .01$).

[1]See footnote 1, table 2.

Values in parantheses denote number of birds.

Table 5. Effect of broiler age on body weight and abdominal/live body weight in males and females of Hubbard and Shaver broiler chickens

Traits	Age in weeks	Strain			
		Hubbard		Shaver	
		M	F	M	F
Body weight/g	7	2387 ± 60.4[a] (18)	1917 ± 73.3[a] (11)	2269 ± 61.8[a] (13)	1826 ± 59.5[a] (14)
	8	2684 ± 56.3[b] (19)	2268 ± 60.0[b] (17)	2644 ± 53.1[b] (19)	2230 ± 56.0[b] (13)
Abdominal fat/live body weight (%)	7	3.03 ± 0.18[a] (16)	3.71 ± 0.22[a] (11)	3.15 ± 0.18[a] (13)	3.67 ± 0.17[a] (14)
	8	3.50 ± 0.17[a] (19)	3.94 ± 0.18[a] (17)	3.16 ± 0.15[a] (19)	4.10 ± 0.16[a] (13)

[a,b,c] Values in columns within each trait, followed by different letters differ significantly ($P \leq .01$).
Values in paranthese denote number of birds.

Table 6. Overall means and standard errors for live body, carcass, and abdominal weights and abdominal fat/live body weight of Hubbard and Shaver chickens slaughtered at 7 and 8 weeks of age

Traits	Age			
	7 weeks		8 weeks	
	Hubbard	Shaver	Hubbard	Shaver
Body weight/g	2190 ± 60.40	2039 ± 60.40	2481 ± 52.30	2461 ± 52.30
Eviscerated carcass/g	1584 ± 46.60	1493 ± 46.60	1825 ± 40.30	1808 ± 40.30
Abdominal fat/g	71.40 ± 3.40	68.90 ± 3.40	92.10 ± 2.97	88.80 ± 2.97
Abdominal fat/live body weight (%)	3.28 ± 0.15 (27)	3.42 ± 0.15 (27)	3.75 ± 0.13 (36)	3.64 ± 0.13 (36)

No significant differences were noted between the two strains of broilers for the different parameters within each age period.
Values in parentheses denote number of birds.

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تأثير تحديد التغذية المبكرة على الأداء اللاحق لنوعين من هجـن اللاحـم التجاريـة

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هدفت الدراسة إلى تقييم النمو، استهـلاك العلف، معدل تحـويل الغـذاء ونسبة دهن الأحشاء لنـوعين من هجن الـلاحم (الشيفر والهـبرد) والتي عرضت إلى تحديد إستهلاك العلف التجاري في عمـر مبكر، استخـدم في هذه الـدراسة نظم التغذية التالية: التغذية الكاملة (C) تحـديد التغـذية المعتـدلة (MR) وتحـديد التغذية الشديدة (SR) خـلال الأسبوع الثـاني والثالث من العمـر بعد ذلـك طبق نظام التغذية الكامـل على الجميـع حتى الأسبوع السـابع أو الثـامن حسب عمر الذبح.

دلت النتائج على أن الزيادة في الوزن بعد اعادة نظام التغذية الكامل كانت كافية تماماً لتعـويض التأخـير في نمو جميـع الطيـور التي تعرضت لنـظامي تحديـد التغذية، كذلك إتضح أنه لا توجد فروقات معنوية بـين الأوزان النهائيـة للطيور التي خضعت لنظم التغذية المختلفة وتشير هذه النتائج إلى أن فروج اللاحم قادر على النمو التعويضي عندما يحصل على تغذية كاملة بعـد تحديـد التغذيـة المبكر، كذلك وضحت النتائج أن إستهلاك العلف يقل معنوياً مع زيادة تحديد التغـذية المبكر، وقد تبين من هذه الـدراسة انـه لا توجـد فروقـات معنويـة بين النـوعين بالنسبة لجميع الصفات المدروسة.

أما بالنسبة لدهن الأحشاء فإن نسبته أعلى معنـوياً في الإنـاث بالمقـارنة مـع الذكور، لكن هذه الاختلافات الجنسية ليست مميزة ضمن كل مجموعة عمـرية. وعلى ضوء هذه النتائج فإنه يمكن الاستدلال على أن تحديد التغذية ليس له تـأثير ضار على الأوزان النهائية عند عمر سبعة أو ثمان أسابيع.