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EFFECT OF REPLACING SOYBEAN MEAL WITH GRADED LEVELS OF DRIED YEAST ON BROILER CHICKS PERFORMANCE

By

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Abstract: *The objective of this investigation was designed to evaluate the influence of substituting soybean meal (SBM) with graded levels (0, 2, 4 and 6%) of dried yeast (DY, Saccharomyces cerevisiae) in the starter and finisher diet, on performance of broiler chicks. A total number of one hundred and twenty unsexed one-week old Arbor Acres broiler chicks were used. Chicks were randomly distributed into four equal experimental groups.Each experimental group had three replicates, ten chicks each. Starter and finisher diets were formulated to include 21% CP, 2900 Kcal ME /kg diet and 17.5% CP and 3100 Kcal ME /kg diet, respectively. The following findings were obtained during the entire period (7 weeks of age) as follow:*

Live body weight (LBW) and live body weight gain (LBWG) values of chicks fed diets containing 2 or 4 % DY were not significantly different from those fed the control diet. While, significant differences were appeared between chicks fed the control diet and those fed diet containing 6% DY. Also, significant differences in feed intake (FI) were remarked between both the control group and the treatment of 2% DY and both of the other two experimental treatments of 4 and 6% DY. Moreover, increasing DY level in the diet decreased FI, and the experimental group fed 6% DY insignificantly recorded the least value. Feed conversion (FC), carcass characteristics, specific gravity, crude protein conversion (CPC), caloric efficiency ratios (CER) and chemical analysis of blended carcass flesh were not significantly affected by different experimental treatments. Furthermore, increasing of DY level up to 6% in the diet of broiler chicks, relatively reduced the cost of feed / Kg body weight gain, compared *to the control diet, which had the highest price. DY supplemented diets up to 6% improved economic and relative economic efficiency.*

In conclusion, DY could replace of soybean meal in broiler chicks diet up to 6% without any decline effects on performance and economic efficiency of broiler chicks.

INTRODUCTION

From the economic point of view, feed cost in poultry projects has been ranked the largest portion. Also, crude protein in formulated poultry diets is considered the most expensive component. In case of rise of international market price of soybean meal (SBM) or when it is in short supply, dried yeast (DY) may successfully become an alternative of SBM in poultry diets. So, DY is rich in protein, energy and many essential amino acids particularly lysine, but it is low in methionine and total sulfur amino acids (Saoud and Daghir, 1980 and Osman, 1996). The utilization of yeast culture is varied among poultry species and also depends on levels which incorporated in poultry feeds (Savage and Mirosh, 1990 a).In this respect, Abd El-Wahed et al., (2003) concluded that DY could substitute SBM up to 2 % in diets of growing Golden Montazah chicks without harmful effects on their performance. Moreover, including of yeast culture in poultry diets has a positive effect on growth performance as reported by Savage and Mirosh, (1990, b,c) with turkey; Osman et al. (1996) with pekin ducklings; Ali et al. (2000) with quails; Vogt and Mathes (1991) and Abdel- Azeem (2002) with broiler chicks. This improvement may attribute to yeast cultures, also, could be due to decrease proliferation of pathogenic bacteria (Miles, 1993). Stockland, (1993) reported that, yeast cultures were found to stimulate the activity of certain important bacteria, which are actively involved with the digestive process, protein synthesis and nutrient absorption in the gastro-intestinal tract of piglets. In this respect, Miles and Bootwella, (1991) declared that, yeast culture contains large amounts of the yeast metabolites. These metabolites colony with some viable yeast cells are principal functional components of this type of culture used as a probiotic. Fuller (1989) defined probiotic as a live microbial feed supplement which beneficially affects the host animal by improving its intestinal microbial balance. The mode of action of probiotics (Sisson, 1988 and Makled, 1991) may operate by producing antibiotic substances and inhibiting harmful bacteria, altering microbial metabolism and decrease intestinal pH. Moreover, Butler and Stone, (1990) mentioned that, live yeast cells contain considerable amount of active phytase, which can increase the available phosphorus due to plant phytate hydrolysis and can reduce plant phytate ability to chelate cation minerals like calcium, magnesium and zinc in the form of phytin, which in turn can easily make a significant contribution to mineral availability.

The main objective of the present investigation was to study the efficiency of substituting soybean meal with graded levels of supplemented dietary dried yeast (as an alternative source of protein) on productive performance of broiler chicks.

MATERIAL AND METHODS

The present experimental work was carried out at the El – Takamoly Poultry Project, Fayoum, Egypt during the period from 22 March to 2 May, 2003. One hundred and twenty unsexed Arbor Acres broiler chicks of one week old were used. Chicks were randomly allotted into four equal experimental groups (30 chicks each), and were set in battery brooders equipped with raised wire floors. Each experimental group was distributed into three replicates of 10 chicks each. At the end of the first week, the chicks were wing banded and individually weighed to the nearest gram to obtain the initial live body weights. Chicks of all experimental groups were kept under similar environmental, managerial and hygienic conditions. The four experimental diets were formulated to satisfy nutrient requirements of broiler chicks, where dietary yeast substituted soybean meal at graded levels of 0, 2, 4 and 6 % of the starter and finisher diets. Starter and finisher diets were adjusted to be nearly iso-nitrogenous and iso-caloric. All diets were formulated according to recommendation of National Research Council (NRC, 1994) to include about 21 % CP, ME of 2900 kcal / kg diet and 17.5 % CP and ME of 3100 kcal/kg diet, respectively (Table, 1). The experimental diets and fresh water were supplied ad libitum.

Performance traits:

During the entire period (6 weeks), the following criteria, LBW, FI, LBWG and FC were estimated and / or calculated. For each group of chicks individual LBW, FI and LBWG (equal LBW at later week old minus LBW at the former week old) weekly were recorded. Furthermore, FC (g feed /g gain), CPC and CER were also calculated. Estimation of those performance parameters was performed as outlined by Abd El-Wahed, (1998).

Carcass characteristics:

Twelve fasted chicks (one chick from each replicate of each experimental group) were randomly chosen, then slaughtered (by severing the carotid artery and jugular veins) to measure some carcass traits. Carcasses were manually eviscerated and weighed in air, then immediately, weighed under water, after that, the specific gravity was calculated by using the following formula:

Specific gravity = (Body weight in air – body weight under water) /body weight in air. Furthermore, liver, gizzard, heart, spleen, abdominal fat and giblet (liver, gizzard, heart and spleen) were removed and weighed.

Weights of carcass and the internal organs were expressed as percentages of LBW.

Chemical analysis of blended flesh (boneless meat)

Proximate analysis of blended carcass flesh samples (boneless meat) for CP, CF, ash and NFE percentages (on DM basis) were determined according to the official methods of A.O.A.C. (1980).

Economic efficiency

The cost of feed / kg LBWG was calculated on the basis of the price of one kg diet for each of the different experimental diets (starter and finisher diets). Values of economic efficiency were calculated as the net revenue per unit of total cost. Generally, economic efficiency and relative economic efficiency were estimated according to Osman (1997).

Statistical analysis

Analysis of variances was performed according to Steel and Torrie (1980). While significant differences in means were achieved by utilizing Duncan's multiple range test (Duncan, 1955).

RESULTS AND DISCUSSION

Productive performance parameters

Live body weight (LBW)

Throughout the entire period (7 weeks old), the finding (Table, 2) indicated insignificant differences in LBW were detected among the experimental groups fed 0, 2, and 4 % dietary DY. The experimental group fed 6 % DY, gave significantly the lowest LBW value, compared to the control group, which realized the heaviest LBW. However, the differences in LBW among the experimental groups fed diet incorporating DY were insignificant. Currently, with increasing DY level in the experimental treatments, LBW was reduced, which may attribute to the deterioration in FI (Table, 3). These findings agreed with those reported by Osman (1996). On the contrary, Ali et al., (2000) using Japanese quail and Abdel Azeem (2002) using broilers and found that groups fed diets supplemented with yeast had significantly improved LBW than those fed the control diet.

Live body weight gain (LBWG)

During the starter period (1-4 weeks), LBWG was not significantly affected by diets supplemented with different dietary DY levels, compared to the control group. Chicks fed diets containing 6% DY significantly recorded the worst LBWG value compared with those fed the control diet at finisher period (5-7 weeks). The same trend was observed at the overall period (1-7 weeks) as shown in Table, 3. No significant differences in LBWG between chicks fed the control diet and those fed diets containing either 2 or 4% DY. While a significant difference was observed between chicks fed the control diet and chicks fed diets containing 6 % DY, which achieved a decrement in LBWG value. This decrement was attributed to the deficiency and /or poor availability of the yeast in methionin and total sulfur amino acids (Daghir and Abdel Baki, 1977 and Osman, 1996).

Feed intake (FI)

As shown in Table (3), at 1-4 weeks old, adding DY to the diets of experimental groups did not exhibit any significant differences for FI among the experimental treatments. At 5-7 weeks, supplementation of DY to the diet of experimental groups detected that those chicks significantly consumed less feed than the control group, which significantly recorded the highest FI value. This may be due to the low palatability for the diets which were supplemented with DY. At 1-7 weeks, extremely FI represented similar trend as FI of the finisher period (5-7 weeks), where the experimental group fed diet supplemented with 6% DY significantly achieved the lowest FI value. While the highest FI values significantly were represented by the control group. The previous results agreed with those obtained by Osman (1996) who explained that, replacement of SBM protein by DY numerically reduced FI, which caused the depression in body weight of broilers. This may be due to the poor availability of the yeast in methionine and total sulfur amino acids, the dusty nature of DY which negatively affected feed intake and to the high level of the nucleic acid present in DY.

Feed conversion (FC)

Feed conversion ratio measure usually refers to the weight ratio of the consumed diet per unit of LBWG of broiler chicks production, and it is considered as a measure for the efficiency of conversion the diet into internal body organs and muscle tissues.

Throughout the different experimental intervals (1-4, 5-7 and 1-7 weeks), the present finding of FC (Table, 3) revealed that substitution SBM by DY did not yield any deterioration and the differences among the experimental treatments were insignificant, and these different intervals nearly brought out the same trend. In resume, DY addition in the diet of broiler chicks apparently, exhibited a profound impact on improvement of feed utilization. This may be due to that yeast cells contain considerable amount of active phytase, which can enhance the available phosphorus return to plant phytate hydrolysis (Butler and Stone, 1990). These results were confirmed by Soliman (2003) and with Osman (1996) who concluded that, replacement of SBM protein by DY protein had insignificant effect on FC. However, Purshothaman and Natanam (1999) pronounced that using of yeast culture 1g/kg in broilers diets resulted in significant improvements in growth rate and FC efficiency. In this respect, Also, the previous results of FC may return to yeast culture contains numerous amounts of metabolites as well as some viable yeast cells do as a brobiotic (Miles and Bootwella, 1991), where it may produce antibiotic substances for inhibiting harmful bacteria, altering microbial metabolism and decrease intestinal pH. And, also, may due to, yeast culture could stimulate some advantageous bacteria that actively bind with digestive process, protein synthesis and nutrient absorption in the gastro–intestinal tract (Stockland, 1993).

Crude protein conversion (CPC) and Caloric efficiency ratio (CER):

Meat type chickens were selected for faster growth, utilize dietary energy and protein more efficiency than other birds (Proudman et al., 1970 and Pym et al., 1984). There were insignificant effects resultants of substitution SBM by DY in the diets of broiler chicks on either of CPC or CER (Table, 3) during the different intervals (1-4, 5-7 and 1-7 old). In this respect, Chambers (1990) declared that more efficient use of energy and amino acids by the chicks reduced nutrient requirement for maintenance to market weight due to faster growth, increased rate of food passage and improved intestinal absorption of glucose. Eventually, the former findings of CPC and CER (Table, 3) were quite reasonable, especially, the experimental diets were adjusted to be nearly isocaloric and isonitrogenous.

Slaughter test:

The present results (Table, 4) of carcass weight, carcass % of LBW, internal organs (liver, gizzard, heart, spleen, abdominal fat), giblet % (expressed as % of LBW) and specific gravity apparently, brought out insignificant variations among the experimental treatments compared to the control group. In this respect, the insignificant changes in gizzard may reflect no changes in ability and function of digestion (Al-Harthi, 2004). Furthermore, abdominal fat content could be influenced by the fatty acid profile (Crespo and Esteve-Garcia, 2001), thus the possible reduction in lipid deposition should be concomitant with an increase in energy expenditure. The former finding of slaughter characteristics were in harmony with those obtained by El Yamny and Fadel (2004), El Ghamry et al., (2002), Kumprechtova et al., (2000) and Naik et al., (2000) who predicated that the differences of slaughtered characteristics between the experimental treatments and the control group were insignificant. In this regard, Abdel Azeem (2002) found that carcass traits and internal organs were not affected due to the addition of yeast culture at 1g/kg broilers diet. In addition, Subrata et al., (1997) studied the effect of feeding yeast and antibiotic on the performance of broilers, and found that carcass parameters did not differ among treatments.

Chemical analysis of carcass flesh:

It is clear that, the differences in the chemical analysis for carcass flesh (CP, CF, ash and NFE percentages) among the different experimental dietary groups were insignificant (Table, 5). These finding deduced that, replacement of SBM by DY could not bring out any detrimental effects on chemical analysis of carcass flesh. Regarding to CP values, the experimental treatments supplemented with DY were insignificantly higher in CP than the control group, this may be indicative of enhancing muscles formation resultant of adding DY in the diet of broilers. As for crude fat, the insignificant differences among all the experimental groups may explain that, if changes in fat deposition occurs in chickens, it occurred primary in skin and adipose tissues, will less marked changes occur in muscle tissues (Dansky and Hill, 1952 and Essary and Dawson, 1955). The present results of the chemical analysis of carcass flesh are similar to those reported by Namra (2000), who mentioned that, on such isocaloric and isonitrogenous diets which may have approximately constant C: P ratio, that variation in the chemical composition of meat would be minimal.

Economic efficiency:

The term, economic efficiency is a mean of expressing the money output returned for body weight gain relative to the price of feed consumed. From economic point view, the experimental group fed 6% DY yielded better economic efficiency than the other experimental group. The above-mentioned finding of feed cost per Kg gain and economic efficiency indicated that DY supplemented diets up to 6% improved economic efficiency and relative economic efficiency (Table,6)

It could be concluded that, with reference of FC and economic efficiency values, DY satisfactorily could be utilized up to 6% replacing of SBM, without any decline effects on performance and economic efficiency of broiler chicks.

Table (1) : Composition and analysis of the experimental diets of broilers chicks.

Ingredient, %	Starter diets (1-4 weeks)				Finisher diets (5 -7 weeks)			
	Control	2% DY	4% DY	6% DY	Control	2% DY	4% DY	6% DY
Yellow corn, ground	61.90	61.90	61.90	61.90	73.60	73.60	73.60	73.60
Soybean meal, (44 %)	32.00	30.00	28.00	26.00	15.80	13.80	11.80	9.80
Corn gluten	2.40	2.40	2.40	2.40	6.8	6.80	6.80	6.80
Dried yeast	0	2.00	4.00	6.00	0	2.00	4.00	6.00
Dicalcium phosphat	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Limestone	1.00	1.00	1.00	1.00	1.15	1.15	1.15	1.15
Salt	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Premix *	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
L-Lysine`	-	-	-	-	0.03	0.03	0.03	0.03
DL-methionine	0.10	0.10	0.10	0.10	0.02	0.02	0.02	0.02
Total	100	100	100	100	100	100	100	100
Calculated analysis								
Crude protein%	21.03	21.03	21.03	21.03	17.52	17.52	17.52	17.52
ME, Kcal/kg diet	2902.01	2897.21	2892.41	2887.61	3093.44	3088.64	3083.84	3079.04
Ether Extract %	2.67	2.67	2.68	2.68	3.10	3.10	3.10	3.11
Crude fiber %	3.73	3.60	3.48	3.35	2.86	2.73	2.61	2.48
Lysine %	1.11	1.12	1.12	1.13	0.74	0.71	0.72	0.73
Methionine %	0.48	0.48	0.48	0.48	0.40	0.40	0.40	0.40
Methionine + cystine %	0.82	0.79	0.76	0.74	0.7	0.68	0.64	0.61
Calcium	0.91	0.91	0.90	0.90	0.92	0.92	0.92	0.91
Total phosphorus	0.77	0.78	0.80	0.81	0.72	0.73	0.75	0.76
Available Phosphorus	0.53	0.52	0.52	0.51	0.50	0.50	0.49	0.50
Cost/ton, L.E., prices of 2003	972.10	966.90	961.60	956.30	929.10	923.80	918.50	913.20

*Adwia B-broiler premix, the vitamin mineral premix (as mg or I.U./kg diet) was added as 3 kg per ton of diet and supplied : Vit.A 12000 I.U., Vit.D3 2000 I.U.,Vit.E 10 mg, Vit K3 2mg,Vit.B1 1mg, Vit.B2 4mg, Vit.B6 1.5 mg, Pantothenic acid 10 mg, Vit.B12 0.01 mg, Folic acid 1 mg, Niacin 20 mg, Biotin 0.05mg, Choline chloride 500 mg, Zn 55 mg, Cu 10 mg, Fe 30 mg, I 1 mg, Se 0.1 mg, Mn 55 mg, Ethoxyquine 3000 mg; Cobalt 0.1 mg.

Table (2): Effect of feeding graded levels of DY on live body weight (LBW) of broilers (mean ± S.E.).

Age (week)	*DY %*			
	0.0	**2**	**4**	**6**
1	106.55 ± 1.87	105.68 ± 2.81	106.14 ± 2.31	104.40 ± 1.66
2	265.34 ± 5.76	266.02 ± 8.2	262.11 ± 6.15	261.70 ± 6.49
3	516.47 ± 7.74	512.90 ± 13.68	487.52 ± 9.72	510.07 ± 10.21
4	861.07 ± 16.30	871.63 ± 22.09	851.52 ± 13.05	873.10 ± 16.73
5	1280.22 ± 18.45	1265.53 ± 29.15	1219.66 ± 24.86	1258.76 ± 21.02
6	1628.38 ± 17.51^{a}	1580.45 ± 34.75^{ab}	1539.00 ± 32.57^{b}	1560.52 ± 24.13^{ab}
7	1956.88 ± 25.35^{a}	1891.54 ± 46.23^{ab}	1850.75 ± 39.95^{ab}	1826.79 ± 32.98^{b}

a, b and c: means in the same row within the same item followed by different superscripts differ significantly at $P< 0.05$.

Table (3): Effect of feeding graded levels of DY on FI, LBWG, FC, CPC, and feed cost of broilers (mean ± S.E.).

Age *(week)*	*Items*	*DY %*			
		0.0	**2**	**4**	**6**
	FI (g/bird)	1257.70±9.50	1257.70±9.50	1254..94 ± 9.30	1261.17±6.06
	LBWG (g)	754.52±15.99	765.95 ± 20.75	745.47 ± 12.50	768.70±16.37
	FC	1.69 ± 0.04	1.69 ± 0.05	1.69 ± 0.02	1.66 ± 0.03
	CPC	0.36 ± 0.01	0.35 ± 0.01	0.36.0.01 ±	0.35 ± 0.01
	CER	4.91 ± 0.13	4.90 ± 0.15	4.91 ± 0.07	4.82 ± 0.10
	Cost of Kg diet (P.T.)	97.21	96.69	96.16	95.63
5-7	**FI (g/bird)**	2677.64±13.72^{a}	2584.45±24.23^{b}	2540.61± 20.33^{b}	2458.44±4.49^{c}
	LBWG (g)	1095.81±25.85^{a}	1019.91 ± 31.46^{a}	1010.56 ±30.36^{ab}	970.00±25.85^{b}
	FC	2.50 ± 0.07	2.49 ± 0.07	2.58 ± 0.10	2.59± 0.08
	CPC	0.44 ± 0.01	0.44 ± 0.01	0.45 ± 0.02	0.45 ± 0.01
	CER	7.26 ± 0.20	7.22 ± 0.21	7.49 ± 0.28	7.50 ± 0.22
	Cost of Kg diet (P.T.)	92.91	92.38	91.85	91.32
1-7	**FI (g/bird)**	3932.50±15.76^{a}	3841.17±44.43^{a}	3795.87 ± 29.11^{b}	3714.96 ± 8.24^{c}
	LBWG (g)	1848.84±25.49^{a}	1786.91±46.28^{ab}	1744.47± 39.48^{ab}	1722.20±33.33^{b}
	FC	2.14 ± 0.03	2.13 ± 0.05	2.19 ± 0.05	2.18 ± 0.05
	CPC	.0.4 ± 0 .01	0.4 ± 0.01	0.41 ± 0.01	0.41 ± 0.01
	CER	6.49± 0.10	6.46 ± 0.15	6.63 ± 0.14	6.61 ± 0.15

a, b and c: means in the same row within the same item followed by superscripts differ significantly at $P< 0.05$.

Table (4): Effect of feeding graded levels of DY on slaughter characteristics of broilers (mean ± (S.E.).

Items	*DY %*			
	0	**2**	**4**	**6**
Slaughter weight, g.	1936.00 ± 4.00	1881.00 ± 74.00	1859.67 ± 67.61	1839.50 ± 4.50
Carcass weight	1325.25 ±32.05	1287.35 ± 58.05	1286.03 ± 65.19	1263.95 ± 26.35
Carcass %.	67.07 ± 3.19	68.42 ± 0.39	69.08 ± 1.02	68.71 ± 1.26
Liver %	3.61 ± 0.27	3.34 ± 0.38	3.13 ± 0.21	4.14 ± 0.31
Gizzard %	3.08 ± 0.06	2.94 ± 0.36	2.94 ± 0.09	2.88 ± 0.08
Heart %	0.71 ± 0.02	0.79 ± 0.04	0.77 ± 0.08	0.77 ± 0.08
Spleen %	0.25 ± 0.02	0.3 ± 0.08	0.24 ± 0.06	0.28 ± 0.02
Giblet, %.	7.65 ± 0.27	7.37 ± 0.78	7.08 ± 0.38	8.07 ± 0.27
Abdominal fat, %.	4.13 ± 0.45	3.92 ± 0.70	4.14 ± 0.49	3.92 ± 0.70
Specific gravity	0.98 ± 0.01	0.98 ± 0.02	0.97 ± 0.01	0.97 ± 0.02

Table (5): Effect of feeding graded levels of DY on chemical analysis of broiler flesh on DM bases (mean ± S.E.).

Items	*DY %*			
	0	**2**	**4**	**6**
Protein %	64.42 ± 3.57	67.76 ± 2.88	64.83 ± 1.73	67.19 ± 1.99
Fat %	30.26 ± 4.10	28.00 ± 2.91	30.06 ± 2.19	27.67 ± 2.73
Ash %	3.17 ± 0.23	3.16 ± 0.03	2.98 ± 0.09	3.07 ± 0.18
NFE %	1.92 ± 0.03	1.82 ± 0.18	1.86 ± 0.03	1.85 ± 0.09

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Soybean Meal, Dried Yeast, Broiler.

الملخص العربى

تأثير إحلال كسب فول الصويا بمستويات متدرجة من الخميرة الجافة على الأداء الانتاجى لبدارى اللحم

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أجريت هذه الدراسة بهدف تقييم كفاءة إحلال كسب فول ألصويا بمستويات متدرجة من ألخميرة الجافة (٠, ٢, ٤, ٦ ٪) على الأداء الإنتاجي لبدارى اللحم. أستخدم مائة وعشرون كتكوت عمر أسبوع من نوع Arbor Acres توزعت عشوائيا في بطاريات إلى أربعة مجاميع متساوية العدد, كل مجموعة مكونة من ثلاث مكررات متساوية العدد أيضا (لكل مكرر عشرة كتاكيت)، غذيت الكتاكيت على أربعة معاملات غذائية, واحتوى الغذاء البادئ تقريبا على ٢١٪ بروتين خام, ٢٩٠٠ كيلو كالورى طاقة ممثلة لكل كجم غذاء, و غذيت الكتاكيت على الغذاء البادئ من عمر أسبوع حتى عمر أربعة أسابيع. بينما احتوى الغذاء الناهي على حوالي على ١٧,٥٪ بروتين خام, ٣١٠٠ كيلو كالورى طاقة ممثلة لكل كجم غذاء و تغذت الكتاكيت على الغذاء الناهي من بداية الأسبوع الخامس وحتى عمر سبعة أسابيع. و قد تم تقديم المعاملات الغذائية التجريبية والماء النظيف حتى الشبع. وكانت النتائج في نهاية الأسبوع السابع على النحو التالي:-

١- لا يوجد اختلافات معنوية في وزن الجسم الحي بين المجاميع التجريبية التي تغذت على مستويات متدرجة من ألخميرة الجافة, بينما ظهرت فروق معنوية بين المجموعة المغذاة على مستوى ٦٪ خميرة جافة و المجموعة الضابطة (الكنترول).

٢- لم تظهر اختلافات معنوية في مقدار للغذاء المأكول بين المعاملتين التجريبيتين الكنترول و المعاملة ٢٪ خميرة جافة, ولكنهما ا ظهرتا فروق معنوية مع المعاملتين التجريبيتين ٤ , ٦٪ خميرة جافة, و المعاملتين التجريبيتين الأخيرتين كان بينهما أيضا فروق معنوية.

٣- وجدت فروق معنوية في مقدار الزيادة في وزن الجسم الحي فقط بين المعاملة الكنترول و المعاملة التجريبية ٦٪ خميرة جافة و قد أعطت المجموعة الكنترول أفضل زيادة في وزن الجسم بينما أعطت المجموعة التجريبية المغذاة على ٦٪ خميرة جافة أقل زيادة في وزن الجسم.

٤- إضافة مستويات مختلفة من ألخميرة الجافة إلى غذاء دجاج ألمائدة لم يظهر اختلافات معنوية بين المجاميع التجريبية المختلفة في كل من : معدل تحويل الغذاء و كفاءة تحويل البروتين و كفاءة تحويل الطاقة و وزن الذبيحة و نسب وزن كل من الذبيحة, ألكبد, ألقلب, ألقونصة, الطحال والأعضاء المأكولة و دهن البطن و الوزن النوعي و البروتين الخام, الدهن الخام, الرماد, المستخلص الخالي من النتروجين في لحم دجاج ألما ئده الخالي من العظم.

٥- أمداد غذاء دجاج ألما ئده بألخميرة الجافة حتى مستوى ٦٪ حسن من الكفاءة الاقتصادية.

يمكن التوصية باستخدام ألخميرة الجافة في غذاء كتاكيت اللحم حتى مستوى ٦٪ دون الأضرار بالأداء الانتاجى و الكفاءة ألاقتصاديه لدجاج اللحم.