بسم الله الرحمن الرحيم

Sudan University of Science and Technology

College of Graduate Studies

Effect of Dietary Addition of Prebiotics on the Performance and Dressing Percentage of Broiler Chicks

الإضافة الغذائية للبريبيوتك علي أداء ونسبة التصافي للدجاج اللاحم

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بسم الله الرحمن الرحيم

الإستهـلال

<u>قال تعالى</u> :-

(إنَّ اللهَ فالقُ الحبِ والنوى يخرج الحي من الميت ومخرجُ الميتِ منْ الحيّ ذلكمُ اللهُ فأنى تؤفكونَ)

صدق الله العظيم

سورة الأنعام الآية (95)

DEDICATION

To my dear family

Mother and Aunt Souls

Father

Brothers and Sisters

I dedicate this work

With love and respect

Acknowledgements

Grateful thanks to Allah who gave me the health and patience to complete this work.

I wish to express special appreciation and gratitude to Prof. Mohammed Tag Eldin Ibrahim for his great deed.

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Abstract

A study was conducted to evaluate the effect of dietary addition of prebiotic on performance and dressing percentage of broiler chicks. One hundred and twenty unsexed, 9 days old broiler chicks (*Hubbard F15*) were used for the study. The birds were distributed into three groups (40chicks/group) using complete randomized design each group was subdivided into four replicates of 10 chicks each. Three experimental diets were formulated for starter (1-15) and finisher (16-21) periods. Diet (A) served as control group with no prebiotic level (0%), diets (B) and (C) contained prebiotic at level of (0.075%) and (0.15%) respectively. Data from this study were subjected to one way ANOVA followed by least significant difference (LSD) to test the differences among the groups. The results showed no significant effects of prebiotic (P□0.05) on feed intake, weight gain, feed conversion ratio, livability, production efficiency factor, protein efficiency ratio, energy efficiency ratio and dressing percentage. It concluded that the prebiotic utilized under experimental conditions of this study had no effect on the performance and dressing percentage of broiler chickens.

ملخص الدراسة

أجريت هذة الدراسة لتقييم أثر إضافة البريبويتك في علائق الدجاج اللاحم علي الأداء ونسبة التصافي . تم إستخدام 120 كتكوت عمر 9 أيام من سلالة (Hubbard F15)، وزعت الطيور الي3 مجموعات (40 طائر لكل مجموعة) باستخدام التنظيم كامل العشوائية (CRD)،تم تقسيم كل مجموعة الي 4 مكررات (10 طيورلكل مكررة) .تم تركيب ثلاث 3علائق علي مرحلتي البادي والناهي.تم اختيارالعليقة (A) لتكون المجموعة الضابطة وذلك بعدم إضافة بريبويتك (0%) وإحتوت العليقتين (B) و (C) علي (0.075%) و(0.15%) بريبويتك علي التوالي. أخضعت النتائج المتحصل عليها من هذه الدراسة لتحليل التباين في الإتجاه الواحد وأتبعت بإختبار اقل فرق معنوي (LSD) لإختبار الفرق بين المجموعات. أظهرت النتائج عدم وجود أثر معنوي للبريبويتك (P □ 0.05)علي إستهلاك العلف، الوزن المكتسب، معدل التحويل الغذائي، الحياتية، معامل الكفاءة الإنتاجية، معدل كفاءة البروتين، معدل كفاءة الطاقة ونسبة التصافي. خلصت الدراسة الي أن إستخدام البريبويتك في علائق الدجاج اللاحم ليس لة تأثيرعلي كل من الأداء ونسبة التصافي للدجاج اللاحم في ظل الظروف البيئية التي أجريت فيها الدراسة.

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CHAPTER ONE

INTRODUCTION

Nutrition is the most expensive factor in poultry production. The cost of Feed contributes to about 70-75% of the total production cost. Main challenges face the poultry industry in developing countries improving production efficiency and feed utilization (Ayanwale *et al*., 2006). To achieve a profitable balance among the cost of feed and quality of product there is needed to certain additives in broiler ration (Pervez *et al*., 2011).

Feed additives are widely used in poultry industry for several decades in animal nutrition to get better quality of feed, enhance animal performance and health condition (Hashemi and Davoodi, 2011). Changes in gut function and microbial environment of domestic animals fed with diets containing feed additives have been reported as important tool for improving growth performance and feed efficiency (Mawahib *et al*., 2016).

Growth promoters such as prebiotics can be use as alternatives non-antibiotic feed additives to their no harmful side effects on consumers and to improve broiler chickens growth performance via stimulating immune system which lead to enhance health, decrease morbidity and improving profitability.

The objective of this study is to evaluate the effect of prebiotics on broiler performance and dressing percentage.

CHAPTER TOW

LITERATURE REVIEW

2.1. Microbial Population:

Several organisms are in the gastrointestinal tracts of poultry are play a vital role in normal digestive processes and maintaining healthiness (Kaoud, 2010). Scientists are putting efforts to establish the delicate prebiotics relationships of poultry with their bacteria, especially in the digestive tract, where they are very important to the well being of poultry (Lutful Kabir, 2009).

2.2. Prebiotics:

Prebiotics are non-digestible feed supplements selectively fermented by beneficial microflora and utilized to exclude the pathogenic microbes (Dhama *et al.*, 2008**)**. The modes of action increasing of useful microorganisms in large intestine thus enhance the gastrointestinal functions and immune system. They also influence bone mineralization by increasing calcium and magnesium absorption which stimulates bone formation (Younis *et al*., 2015). Prebiotics include oligosaccharide beta-glucans and mannanoligosaccharides. oligosaccharide beta-glucans are long chain of polysaccharides with only one kind of structural unit (Alena *et al*., 2012) is the main structural elements of cell wall of yeast, fungi, some bacteria and cereals like oat and barley (Volman *et al*., 2008), the differences of macromolecular structure of oligosaccharide beta-glucans depend on their origin. The origin from yeast cell wall might stimulate performance because of their immunomodulatory effect (Huyghebaert *et al.,* 2011). The main action is to improve phagocytosis and proliferation of monocytes and macrophages (Novak and Vetvicka, 2008).

Macrophages play a vital role in immunomodulation, interaction between glucans and macrophages by hanging effect in host.

Mannanoligosaccharides is one of the most common oligosaccharides which obtained from the cell wall of yeast (*Saccharomyces cerevisiae).* The main component is mannose which is a unique sugar because many enteric bacteria have receptors that bind to it. These receptors, called type1 Fimbriae are involved in the attachment of bacteria to host cells and this attachment is critical for bacterium to cause disease for host. In addition, mannanoligosaccharides has important functions as competitive binding site to the bacteria, hence the bacteria bind to mannanoligosaccharides rather than binding to the intestine. Therefore, mannanoligosaccharides can be considered as useful tool to reduce "bad" bacteria in the gut (Griggs and Jacob, 2005).

2.3. Yeasts:

Yeasts are microbes which are probably one of the earliest domesticated Organism's eukaryotic classified in the kingdom fungi (Adebiyi *et al*., 2012). The mode of action is the inhibition of pathogen adhesion to gastrointestinal epithelial tissue by blocking carbohydrate binding adhesins on bacteria, boosting of mucosal immunity leads to general protection of animal health and productivity. Yeasts also adsorb mycotoxins in feed and inhibit their toxic action (Kogan and Kocher, 2007).

Yeasts has important nutritive value as an excellent source of amino acids, good sources of minerals and vitamin B complex, a source of digestive enzymes of various kinds, boosts immunity system resulting in better protection against infection, constant interaction with crude fiber resulting in increased fiber digestion and augments the digestive processes initiating fermentation processes (Panda *et al*., 2011).

Saccharomyce cerevisiae is one of the most widely commercialized species known as *baker's* yeast used as effective growth promoter with no side effects on animal health. It has been used for centuries, including a variety of process brewing of bread-making (Broadway *et al*., 2015) direct fed-microbial in poultry diets (Salim *et al*., 2013) for helping digestion and efficient utilization (Nikpiran *et al*., 2013) and counteract aflatoxicosis in broiler chickens (Gheisari and Kholeghipour, 2006).

2.4. Effect of dietary supplementation on broiler performance:

2.4.1. Feed intake:

Shendare *et al*., (2008) reported that supplementation broiler diets with %0.1 Manno-Oligosaccharide and β-glucans compare to non supplemented diet had less influence feed intake, while Benites *et al*., (2008) found that feeding different levels of Mannan-Oligosaccharide (0%, 0.1% and 0.05%) in broiler chickens had no effect on feed intake among the feeding groups. Also Baurhoo *et al*., (2009) reported that feeding broiler chickens with 0.2% and 0.5% of Mannan-Oligosaccharide were not differing in feed intake. On the other hand, addition of prebiotic at levels 0.2% and 0.05% in broilers diets increased feed intake (Abdel-Raheem and Abd-Allah, 2011).

2.4.2. Live body weight and body weight gain:

Feeding broilers with % 0.1 Manno-Oligosaccharide and β-glucans showed significant influence on live weight and body weight gain compare to control diet (Shendare *et al*., 2008), where as Benites *et al*., (2008) found no significant effect on average body weight gain of broilers fed at 0.1% and 0.05% levels of Mannan-Oligosaccharide. While Baurhoo *et al*., (2009) reported that there were no significant difference in body weight at 0.2% and 0.5% Mannan-Oligosaccharide. However the addition of prebiotics supplemented in broilers diets at levels 0.2% and 0.05% significantly improved body weight and weight gain (Abdel-Raheem and Abd-Allah, 2011).

2.4.3. Feed conversion ratio (FCR):

Broiler chickens fed with %0.1 Manno-Oligosaccharide and β-glucans improve in feed efficiency (Shendare *et al*., 2008), while Benites *et al*., (2008) found that there were no significant differences in feed conversion ratio at 0.1% and 0.05% Mannan-Oligosaccharide, Also Baurhoo *et al.*, (2009) found no significant differences in feed conversion ratio at 0.2% and 0.5% Mannan-Oligosaccharide. But Abdel-Raheem and Abd-Allah, (2011) noted significant improvement in feed conversion ratio of Bio-mos in broilers diets at levels 0.2% and 0.05%.

2.4.4. Livability and production efficiency factor (PEF):

Low mortality had been recorded in broilers diet with 0.1% Manno-Oligosaccharide and β-glucans (Shendare *et al*., 2008), while addition of 0.2% and 0.05% Bio-mos group in poultry diets had no significant effect on mortality (Abdel-Raheem and Abd-Allah, 2011), but Benites *et al*., (2008) found that there were no significant differences in mortality at 0.1% and 0.05% of Mannan-Oligosaccharide, also Baurhoo *et al.*, (2009) showed that there were no significant differences in mortality at 0.2% and 0.5% of Mannan-Oligosaccharide.

2.4.5. Protein efficiency ratio (PER):

Ashayerizadeh *et al.*, (2011) found that dietary supplementation of Biolex-MB with 0.2% was not significantly improved protein efficiency ratio, while Abdel-Azeem, (2002) found that added 0.1% of yeast in broiler chickens feed was significantly improved protein efficiency ratio.

2.4.6. Energy efficiency ratio (EER):

Ashayerizadeh *et al.*, (2011) found that dietary supplementation of Biolex-MB with 0.2% was not significantly affected energy efficiency ratio, but Abdel-Azeem, (2002) reported that addition of 0.1% yeast had significant effect on energy efficiency ratio.

CHAPTER THREE

MATERIALS AND METHODS

3.1. Experimental location and duration:

The study was conducted at the Poultry Farm at Sudan University of Science and Technology, College of Animal Production Science and Technology during 31^{th} March to the 13^{th} May 2017, under ambient temperature (25.3-45.6°C) and 20% relative humidity.

3.2. Experimental house:

The study was carried out in an open-sided house of iron sheets roofing, wire netting and concrete floor. The long axis of the house extended from east to west facing the wind direction for efficient ventilation. The house was partitioned into twelve experimental units ($1\times1m^2$) each unit was then dried, cleaned and washed by water using high pressure. Units were then disinfected with formalin (37%, 5ml/litter) and wheat straw was spread to make a deep litter of 5cm depth. Each unit represented one replicate which provided with one feeder and one drinker (8L capacity) both feeders and drinkers were washed by water and soap.

3.3. Experimental birds:

One hundred and twenty day old unsexed broiler chicks (*Hubbard F15*) were used in this study. The birds were purchased from Arab Poultry Breeders Company (Ommat). After the incubation period (9 days), the chicks were weighed and randomly distributed into three groups (40chicks/group) each group was replicated into four replicates (10 chicks in each replicate).

3.4. Prevention and vaccination:

On arrival, chicks were vaccinated against Infectious bronchitis and Newcastle disease (IB+ND) by spraying. During the incubation period, chicks received 2ml/L of AD3E multi vitamins in water for 7 days. On 12^{th} day, chicks were vaccinated against infectious bursal disease (IBD) and the dose was repeated on the 19^{th} day of age by eye-drop. On 21^{th} day chicks received the second dose of the ND by eye-drop. (1ml/L) AD3E Multi vitamins were added in drinking water after each vaccination.

3.5. Experimental diets:

The chicks were incubated for 9 days and fed on *Na Po* pre starter broiler (Table1). Commercial prebiotic manufacture compound (*Y-MOS*) was used and obtained from Khairat El Nile Company, it is extract from *Saccharomyces Cerevisiae*, contains 18% of B-glucans and 27% of Mannananoligosaccharides. The other ingredients were purchased from local market and balanced rations were formulated according to (NRC, 1994). Three experimental diets were formulated for starter and finisher periods (Tables 2 and 3) respectively. Diet (A) served as control group with no prebiotic level (0%), diets (B) recommended level as described by the manufacture company and (C) contained prebiotics at a level of (0.075%) and (0.15%) respectively.

Table 1. Chemical composition of the Pre starter

Item	%
Crude Protein	23
Crude Fat	6.50
Crude Fiber	0.50
Crude Ash	3
Lysine	1.40
Calcium	1
Sodium	0.16
Threonine	0.90
Available Phosphorus	0.62
Methionine and Cystine	0.99
Metabolizable Energy	3.100 kcal/Kg

NaPo Pre Starter Feed, Champrix Company, (Netherlands)

Table 2. Ingredients percentages and calculated values of the experimental starter diets

Ingredients	A	B	C
Sorghum	65	65	65
Ground nut cake	27.3	27.3	27.3
Super concentrate*	5	5	5
Oil	1.6	1.6	1.6
Di calcium phosphate	1	1	1
Y-MOS	0	0.075	0.15
Antitoxin	0.1	0.1	0.1
Total	100	100.075	100.15
calculated values			
Metabolizable energy (kcal/kg)	3073.659	3073.659	3073.659
Crude protein	22.00	22.00	22.00
Crude fiber	6.2	6.2	6.2
Methionine	0.34	0.34	0.34
Lysine	1.20	1.20	1.20
Available Phosphorus	0.43	0.43	0.43
Calcium	0.68	0.68	0.68

*Super concentrate composition: Crude protein 35%, Crude fat 2.7%, Crude fiber 4.8%, Calcium 6.8%, Available phosphorus 5.00%, Lysine 12.00%, Methionine 3.71% and (ME) Metabolizable energy 1897.77kcal/kg.

Table 3. Ingredients percentage and calculated values of the experimental finisher diets

Ingredients	A	B	C
Sorghum	72	72	72
Ground nut cake	19	19	19
*Super concentrate	5	5	5
Oil	3.2	3.2	3.2
Di calcium phosphate	0.6	0.6	0.6
Y-MOS	0	0.075	0.15
Antitoxin	0.2	0.2	0.2
Total	100	100.075	100.15
calculated values			
Metabolizable energy (kcal/kg)	3206.643	3206.643	3206.643
Crude protein	18.79	18.79	18.79
Crude fiber	5.8	5.8	5.8
Methionine	0.28	0.28	0.28
Lysine	0.96	0.96	0.96
Available Phosphorus	0.37	0.37	0.37
Calcium	0.55	0.55	0.55

*Super concentrate composition: Crude protein 35%, Crude fat 2.8%, Crude fiber 4.6%, Calcium 6.56%, Available phosphorus 5.14%, Lysine 10.00%, Methionine 3.00% and (ME) Metabolizable energy 1904.45kcal/kg.

Table (4):- Determined analysis of the experimental Starter and Finisher diets (%).

Item	Starter	Finisher
Moisture	5.5	5.5
Crude Protein	18.055	17.85
Crude Fiber	3.005	3.15
Ash	5.75	4.5

3.6. Performance parameters:

3.6.1. Feed intake (FI):

Feed intake was recorded using sensitive balance every day for each replicate by subtracting quantity of residual feed from quantity of provided feed and then calculated as gram/bird.

3.6.2. Live Body weight (LBWT) and body weight gain (BWG):

Live body weight for each replicate was recorded weekly and weight gain was calculated by subtracting the live body weight at beginning of the week from body weight at the end of the same week.

3.6.3. Feed conversion ratio (FCR):

Feed conversion ratio (FCR) was calculated by dividing the amount of the feed intake (g) by body weight gain (g).

3.6.4. Livability:

$$\text{Livability} = \frac{\text{number of live birds}}{\text{total of starting birds}} \times 100$$

3.6.5. Production efficiency factor (PEF):

$$\text{PEF} = \frac{\text{Bird final weight(kg)} \times \text{livability \%}}{\text{age in days} \times \text{FCR}} \times 100$$ (Lemme *et al*., 2006)

3.6.6. Protein intake (PI):

$$\text{PI} = \frac{\text{total feed intake} \times \text{crude protein}}{100}$$

3.6.7. Protein efficiency ratio (PER):

$$\text{PER} = \frac{\text{weight gain}}{\text{protein intake}}$$ (Kamran *et al*., 2008)

3.6.8. Energy intake (EI):

$$EI = \frac{\text{feed intake} \times \text{Metabolizable energy (kcal/kg)}}{1000}$$

3.6.9. Energy efficiency ratio (EER):

EER= $\frac{\text{weight gain} \times 100}{\text{energy intake}}$ (Kamran *et al*., 2008)

3.7. Dressing percentage:

At the end of the experiment (44 days) eight birds from each treatment (2/replicates) were randomly selected. Birds were then individually weighed, slaughtered and carcass weight was recorded. Dressing percentage was calculated as the follows:

$$\text{Dressing \%} = \frac{\text{carcass weight}}{\text{live body weight}} \times 100$$

3.8. Statistical analysis:

Complete randomized design was used. Analysis of variance (ANOVA) was carried out using Statistical Packages of Social Science (SPSS) software program (Version16, 2007). The significant differences among means were determined by least significant differences (LSD) test at 0.05 significant level.

CHAPTER FOUR

RESULTS

4.1. Feed Intake:

The effect of adding different levels of prebiotics on broilers feed intake showed no significant differences between groups (Table 5). However group B (0.075%) almost showed the numerical increase in feed intake.

Table 5. The effect of prebiotics on feed intake (g/bird) of broiler chickens

Feed intake	Inclusion level of prebiotics (%)			Significance level
	A (0)	B (0.075)	C (0.15)	
Week 1	114.42±24.78	113.00±21.46	100.75±11.65	NS
Week 2	355.86±29.76	377.12±48.73	334.98±31.47	NS
Week 3	482.40±39.71	512.38±42.25	483.06±64.94	NS
Week 4	548.10±67.98	634.88±26.89	565.86±85.10	NS
Week 5	696.49±99.58	779.88±41	754.46±137.10	NS
Starter period	470.28±53.00	490.12±66.97	435.73±33.30	NS
Finisher period	1727.00±166.33	1927.10±100.42	1803.40±286.66	NS
Overall period	2197.30±151.11	2417.20±165.49	2239.10±314.37	NS

NS=Not significant, P value< 0.05).

4.2. Weight Gain:

The effect of adding different levels of prebiotics on weight gain of broilers chicken showed no significant differences between groups (Table 6). But group B (0.075%) revealed numerical increase in weight gain.

Table 6. The effect of prebiotics on weight gain (g/bird) of broiler chickens

weight gain	Inclusion level of prebiotics (%)			Significance level
	A (0)	B (0.075)	C (0.15)	
Week 1	106.58±33.36	109.38±25.75	100.88±8.19	NS
Week 2	268.44±52.29	268.38±30.38	243.32±25.15	NS
Week 3	307.20±33.26	312.50±29.92	311.00±15.38	NS
Week 4	355.96±56.25	349.00±53.12	332.83±34.36	NS
Week 5	326.11±127.33	389.75±38.66	381.07±71.81	NS
Starter period	375.02±72.41	377.75±41.01	344.20±25.70	NS
Finisher period	989.28±95.97	1051.20±56.33	1024.90±67.87	NS
Overall period	1364.30±154.80	1429.00±82.45	1369.10±66.16	NS

NS=Not significant, P value<0.05

4.3. Feed Conversion Ratio:

The addition of graded levels of prebiotics on feed conversion ratio (FCR) of broiler chickens is shown in table (7). The results revealed no significant differences among groups. However group B (0.075%) scored numerical increase in FCR.

Table 7. Effect of prebiotics on feed conversion ratio (FCR) of broiler chickens

FCR	Inclusion level of prebiotics (%)			Significance level
	A (0)	B (0.075)	C (0.15)	
Week 1	1.14±0.34	1.05±0.11	1.00±0.15	NS
Week 2	1.35±0.17	1.41±0.12	1.39±0.23	NS
Week 3	1.58±0.17	1.66±0.26	1.56±0.20	NS
Week 4	1.56±0.22	1.84±0.20	1.70±0.12	NS
Week 5	2.71±1.98	2.01±0.15	2.04±0.57	NS
Starter period	1.27±0.15	1.30±0.05	1.28±0.15	NS
Finisher period	1.76±0.29	1.84±0.08	1.76±0.26	NS
Overall period	1.63±0.22	1.69±0.05	1.64±0.23	NS

NS=Not significant, P value<0.05

4.4. Livability and Production Efficiency Factor:

From table (8) the effect of graded levels of prebiotics on livability and production efficiency factor of broiler chickens revealed no significant differences ($P<0.05$) between groups. Group B (0.075%) recorded the highest level in livability and PEF.

Table 8. The evaluation of livability and production efficiency factor (PEF) of broiler chickens using different levels of prebiotics

Livability and PEF	Inclusion level of prebiotics (%)			Significance level
	A (0)	B (0.075)	C (0.15)	
Livability %	95.00±5.77	100.00±0.00	97.50±5.00	NS
Production efficiency factor	20.10±3.46	20.97±1.20	20.37±2.56	NS

NS=Not significant, P value <0.05

4.5. Protein Efficiency Ratio:

Table (9) showed insignificant effect of different levels of prebiotics on protein efficiency ratio of broiler chickens, although of this result was not significant but group B (0.075%) showed the lowest value during the study period.

Table 9. The determination of protein efficiency ratio (PER) of broiler chickens using different levels of prebiotics

PER	Inclusion level of prebiotics (%)			Significance level
	A (0)	B (0.075)	C (0.15)	
Week 1	4.21±1.30	4.30±0.45	4.52±0.76	NS
Week 2	3.34±0.44	3.19±0.26	3.28±0.61	NS
Week 3	3.40±0.40	3.28±0.59	3.48±0.53	NS
Week 4	3.47±0.46	2.92±0.32	3.15±0.22	NS
Week 5	2.58±1.13	2.66±0.20	2.77±0.74	NS
Starter period	3.54±0.43	3.45±0.13	3.54±0.44	NS
Finisher period	3.08±0.48	2.91±0.13	3.08±0.47	NS

NS=Not significant, P value <0.05

4.6. Energy Efficiency Ratio:

Referring to table (10) showed the effect of graded levels of prebiotics on energy efficiency ratio of broilers chicken revealed no significant differences (P<0.05) between groups. In spite of this result, group B (0.075%) almost recorded the lowest level in energy efficiency ratio during experimental period.

Table 10.The evaluation of different levels of prebiotics on energy efficiency ratio (EER) of broiler chickens

EER	Inclusion level of prebiotics (%)			Significance level
	A (0)	B (0.075)	C (0.15)	
Week 1	30.63±9.42	31.32±3.26	32.90±5.47	NS
Week 2	24.37±3.20	23.21±1.91	23.85±4.46	NS
Week 3	19.89±2.32	19.19±3.45	20.34±3.12	NS
Week 4	20.30±2.72	17.06±1.89	18.44±1.32	NS
Week 5	15.10±6.64	15.56±1.19	16.20±4.34	NS
Starter period	25.78±3.11	25.10±0.93	25.79±3.20	NS
Finisher period	18.01±2.82	17.00±0.74	18.00±2.72	NS

NS=Not significant, P value <0.05

4.7. Dressing Percentage:

Table (11) illustrated insignificant effect of different levels of prebiotics on dressing percentage of broiler chickens, but the control group ranked the highest level in dressing percent (P>0.05) during the study period.

Table 11. Determination of different levels of prebiotics on dressing percentage of broiler chickens

dressing%	Inclusion level of prebiotics (%)			Significant level
	A (0)	B (0.075)	C (0.15)	
dressing%	70.91±1.13	69.92±2.18	69.27±1.04	NS

NS=Not significant, P value <0.05

CHAPTER FIVE

DISCUSSION

Several factors affect broilers performance such as environmental factors (May *et al*., 2000, Rahimi *et al.*, 2005, Abu-Dieyeh, 2006, Olanrewaju *et al.*, 2006, Blahova *et al*., 2007, Ghazalah *et al*., 2008, Akyuz, 2009, Castro *et al*., 2009 and Sohail, 2012), different types and/or inclusion rates of feed additives (Yadav *et al.,* 1994 and Fathi *et al*., 2012) and management factors (Segal, 2011) and (WHO, 2016).

The present study showed no significant differences of prebiotics in overall feed intake. Similar results were reported by Benites *et al.*, 2008 who found that feeding different levels of Mannan-Oligosaccharide did not affect feed intake. Also Baurhoo *et al.*, 2009 found that addition of Mannan-Oligosaccharide in poultry diets were not significantly influence feed intake. These results were differed from those of Abdel-Raheem and Abd-Allah, 2011 who observed that addition of Bio-mos in poultry diets increase feed intake. This ought to be due to difference of prebiotics components and/or prebiotics levels.

Also the study showed no significant differences in overall weight gain among the groups fed with different levels of prebiotics. These results were matched with those of Benites *et al.*, 2008 who found that there was no significant difference in weight gain of broilers fed with different levels of Mannan-Oligosaccharide. Also Baurhoo *et al.,* 2009 who reported that addition of Mannan-Oligosaccharide in poultry diets had not significant effect in weight gain. These findings were disagreed with those of Shendare *et al.,* 2008 who found that significant effect in live weight and body weight gain of broilers fed with Manno-Oligosaccharide and β-glucans. Also Abdel-Raheem and Abd-Allah, 2011 who showed that addition of Bio-mos supplemented group in poultry diets significantly improved body weight and weight gain. It might be due to different type of prebiotics.

The present study showed no significant differences in overall feed conversion ratio between groups fed different levels of prebiotics. These results were in line with those of Benites *et al*., 2008 and Baurhoo *et al*., 2009 who found no significant differences in feed conversion ratio of Mannan-Oligosaccharide group. These results were differed with those of Abdel-Raheem and Abd-Allah, 2011 who found that feed conversion rate was significantly improved in Bio-mos groups. Also Shendare *et al*., 2008 reported that broilers fed with Manno-Oligosaccharide and β-glucans improved feed efficiency. This might be due to different inclusion rate Mannan-Oligosaccharide.

Referring to table (8) there were no significant differences in livability and production efficiency factor among the groups fed on different levels of prebiotics during the study period. This result agreed with those of Benites *et al*., 2008 who found that there were no significant differences in mortality of Mannan-Oligosaccharide treatment. Also Abdel-Raheem and Abd-Allah, 2011 reported that addition of Bio-mos supplemented group in poultry diets had no significant effect on mortality. Shendare *et al*., 2008 reported different results showed low in mortality with broilers feed supplemented with Manno-Oligosaccharide and β-glucans. However dietary treatment with different levels of lysine had significantly affect production efficiency factor (Nasr *et al*., 2011). This could be due to differences in additive.

Table (9) reported that there were no significant differences in protein efficiency ratio among the groups fed on different levels of prebiotics. This result was in line with Ashayerizadeh *et al*., 2011 who reported that addition of Biolex-MB in poultry diets had not significant effect in protein efficiency ratio. Contrary finding was found by Abdel-Azeem, 2002 who reported that dietary supplemental of yeast significantly improved protein efficiency ratio. It could be due to protein intake did not affected by dietary supplement hence protein efficiency ratio.

Table (10) indicated that there were insignificant differences among the groups fed on different levels of prebiotics in energy efficiency ratio during experimental period. This result agreed with those of Ashayerizadeh *et al*., 2011 who found that addition of Biolex-MB in poultry diets had not significant affect energy efficiency ratio. These results were disagree with study of Abdel-Azeem, 2002 who found that dietary supplemental of yeast significantly improved energy efficiency ratio. It might be due to energy intake did not affected by dietary supplement there for energy efficiency ratio did not affected.

Table (11) illustrated insignificant differences among the groups fed on different levels of prebiotics on dressing percentage during study period. This result were in line with those of Abdel-Raheem and Abd-Allah, 2011 who recorded that dressing percentage had not effected by Bio-mos supplemented group. Also Baurhoo *et al*., 2009 reported that carcass yields did not affect on Mannan-Oligosaccharide treatment. Disagreed results were study of Ashayerizadeh *et al*., 2009 who reported that addition of Biolex-MB in poultry diets showed lower value in carcass characteristics. This ought to be due to different type of prebiotics.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

Conclusion:

The study concludes that:

- Different levels of *Y-MOS* did not improve performance parameters and dressing percentage of broiler chickens (0.075 and 0.15%).
- Group B (0.075%) showed the highest values in performance parameters. Thought not statistically significant(p□0.05)

Recommendions:

The study recommended that:

- More studies need to be done on broiler chicken performance with addition of different levels of Y-MOS for assessing effect on performance.

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