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Effect of dried bakery powder with and without yeast in the diet on some productive traits of broilers Ross 308.

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Abstract:

This experiment was conducted to find out the effect of replacing two levels of dried bakery with and without yeast instead of the wheat and barley on the productive performance of Ross 308 broilers. At the poultry field, for the research station, College of Agriculture and the Marshes, Thi Qar University, from 11/8/2020 to 12/12/2020, using 270 unsexed one-day-old broiler chicks, were randomly distributed over five experimental treatments and three replicates (18 birds/replicate). The treatments were as follows: **T1:** control treatment without addition, **T2 and T3** added 10 and 20% dried bakery powder without yeast, **T4 and T5** added 10 and 20% dried bakery powder with 0.04% yeast. The results of the study indicated that there was a significant (P≤0.05) improvement in the studied productive traits (Body weight, weight gain, feed intake, food conversion factor, mortality, vital ratio, and production index) for broilers, when added dried bakery powder with yeast, the best addition ratio was 20% dried bakery powder with 0.04% yeast compared to the control treatment and treatments for added dried bakery powder without yeast.

Keywords: dried bakery powder, yeast, productive traits, Ross 308 broilers.

I. INTRODUCTION

According to current global forecasts, broilers by 2025, it will achieve the highest production and consumption level compared to the meat of other livestock and birds, according to what was mentioned (FAO, 2016). This could be related to the fact that chicken meat is an affordable source of protein with high nutritional value, it was a source of some minerals and vitamins, and its meat is low in fat and is easily digested (Al-Fayadh *et al*., 2011). As a result, poultry farming is of great importance in providing a sustainable food supply especially, because chickens have a high feed conversion efficiency compared to other birds and livestock (FAO, 2010). Nutrition is an important aspect of poultry production and breeding, the most important difficulties facing poultry farming in Iraq these days, it was the intense competition between imported meat and eggs at cheap prices and the high cost of feed materials, which were also imported, and if we want to compete with imported poultry meat, this is done by reducing the cost of producing feed materials and improving the quality of the meat produced. Feed costs constitute about 70% of the total cost of rearing, where broiler meals depend on grains and soybean meal as a main source of energy and protein, whole grains were a major component of poultry rations (Epao et al., 2017), it constitutes 40-60% of the components of broiler diets (Kasab, 2019). Use dry bakery (dried) to feed poultry, produced in large quantities in Iraq, reaching tens of thousands of tons

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annually, it has a representative energy of about 3364 kilocalories/ kg, more energy than yellow corn, the crude protein content is 11.37%, lysine 0.35%, and methionine 0.23%, it does not contain anti-nutrients that inhibit poultry growth (Dabron *et al*., 1999). Leftover bakery is rich in vitamins, rich in energy and low in fiber, does not contain any anti-nutritional agent, better to use it to replace corn in broiler diets, it will benefit poultry producers and the poultry industry (Al-Tulaihan *et al*., 2004). Antibiotics are usually used in poultry production in order to obtain the best health and performance, some researchers have tried using antibiotics, it can be found naturally in bacteria and yeasts, but yeast has been proven to be more effective than others, as a source of probiotics to improve bird performance (Gaggia *et al*., 2010). *Sacchromyces cerevies* is an important microbe, which were used in microbial fermentation, for its high growth ability and ease of control, so it is widely used in industries, in addition to its high probiotic content and health safety (Javadi *et al*., 2012). The current study aims to detemine the effect of using dried bakery powder with and without yeast in the diet on some productive traits of Ross 308 broilers.

II. MATERIALS AND METHODS

This experiment was conducted in the poultry field of the research station at the College of Agriculture and the Marshes, Thi Qar University, from 11/8/2020 to 12/12/2020 for 35 days. A total of 270 one day, of 40 g weight, unsexed Ross308 broiler chicks were used, prepared from the lights hatchery in the province of Babylon. The chicks were reared in pens, an area of 1.5 × 1.5 m, were randomly assigned to five treatments, with three replicates for each treatment (18 birds for each replicate), as follows:

1. **T1:** Control without addition.

2. **T2:** Added 10% dried bakery powder without yeast.

3. **T3:** Added 20% dried bakery powder without yeast.

4. **T4:** Added 10% dried bakery powder with 0.04%yeast.

5. **T5:** Added 20% dried baking powder with 0.04% yeast.

Chicks were reared in cages, the area of one cage was 1.5 × 1.5 m, each cage contains 18 broiler chicks (each cage represents one replicate per treatment). Providing the temperature for heating by using electric heaters, gas incubators and air drawers to renew the air and withdraw moisture, while providing sugar with water at a rate of 50 g / liter on the first day, monitoring the temperature using a mercury thermometer and a hygrometer to record the humidity and placing the birds under a program from one day old to 35 days old. Individual cages were numbered to follow birds and record weight. The lighting was continuous for 24 hours during the first three days, then one hour was given darkness for the purpose of accustoming the chicks to darkness and preventing their disturbance. Plastic feed trays with a diameter of 18 cm were used in the first week, then it was replaced by circular plastic feeders, each capacity of 10 kg, and one feeder for each cage that was suspended by ropes in the ceiling at the level of the bird's back to prevent the loss of feed. As for the

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water in inverted plastic sewage tanks, the capacity of one was 2 liters, from one day to 21 days old, then it was replaced with larger filters of 5 liters for up to 35 days. The birds were fed two types of diets, the starter diet from the age of 1-2 days, and the final diet from the age of 22 days until the end of the experiment, the needs of birds of elements and compounds as in the calculated chemical analysis of materials as stated in (NRC, 1994).The analysis of dried bakery according to Qasha (2015), dry bakery is the leftovers of homemade bakery, it was dried under the sun and then crushed to a size of 3-2 mm, as for yeast, it is used for baking and it is available in the market.

Productive traits

As for the productive traits, they are each of the weekly live body weight rate, the weekly weight gain rate, the weekly feed intake, the weekly food conversion factor, the mortality rate, the vital percentage, and the production index.

Statistical analysis

Complete Random Design (CRD) was used to study the effect of different treatments on the studied traits, comparison of the significant differences between the means using Duncan (1955) multiples range test under the significance level of 0.05 and 0.01 and using the SPSS program (2012).

III. RESULTS AND DISCUSSION

body weight

Table (1) indicates the effect of added dried bakery and yeast-treated bakery on the average weekly body weight of broilers, it was noticed that the fermentation of bakery has a significant effect (P≤0.05) on the average body weight, where the mean body weight improved significantly (P≤0.05) at the first week of age of the chicks in treatment T5 (20% dry bakery with yeast), compared to T4 (10% dry bakery with yeast), which showed a significant increase (P≤0.05) compared to treatment T1 (control treatment), the superior significantly (P≤0.05) at the expense of treatment T2 (10% dry bakery without yeast), no significant differences were observed between T2 and T3 treatments (20% dry bakery without yeast) on the one hand, between the two treatments T1 and T3 on the other hand. At the second week of the birds' life, treatment T5 increased significantly (P≤0.05), compared to treatment T4, which significantly (P≤0.05) outperformed treatments T2 and T3, no significant differences were observed between treatments T1 and T4 and treatments T1 and T2 and treatments T2 and T3. At the third week of bird life, the results indicated a significant (P≤0.05) for treatment T5 over treatment of T4. Significantly superior (P≤0.05) compared to the control treatment, which showed a significant superiority (P≤0.05) compared to the two treatments of dry bakery only (T2 and T3), which did not differ significantly between them. At the fourth week of age, the treatments T1, T2, T4 and T5 showed a significant (P≤0.05) superiority over the treatment of T2. These treatments did not differ from each other significantly. At the age of marketing (5th week of bird life). A significant (P≤0.05) increase in the final body weight was observed in treatment T5 at the expense of treatment T4, which was significantly superior to treatment T3, no significant differences were observed between treatments T1, T2 and T4 on

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one hand, and treatments T1, T2 and T3 on the other hand. The final average weight was 2118.33, 2094.67, 2062.00, 2223.33 and 2324.00 g for the T1, T2, T3, T4 and T5 treatments respectively.

Table (1) Effect of added dried bakery with and without yeast to the feed on the average weekly body weight (g) of broilers ± standard error.

Treatments	Age (weeks)				
	1	2	3	4	5
T1	2.90± 183.33d	2.40±470.76bc	7.53±909.66c	8.64±1434.33a	2.02± 2118.33bc
T2	1.73± 190.00c	9.73±458.67cd	4.91±851.66 d	4.87±1441.33 a	9.49±2094.67bc
T3	1.45± 184.33cd	5.60± 449.33d	6.38± 843.66d	6.64± 1360.33b	13.45± 2062.00c
T4	1.45± 205.66b	2.60± 485.33b	4.97±951.33 b	4.09± 1469.33a	23.62± 2223.33b
T5	2.02± 213.66a	1.61± 507.86a	3.21±982.00a	5.69± 1504.33 a	15.83± 2324.00 a
Sig.	*	*	*	*	*

T1: control treatment without addition, **T2 and T3** added 10 and 20% dried bakery powder without yeast, **T4 and T5** added 10 and 20% dried bakery powder with 0.04% yeast. * The vertically different lowercase letters indicate that there are significant differences between all treatments under the 0.05 level of significance.

weight gain

Table (2) shows the effect of added dried bakery with and without yeast to the feed on the rate of weekly weight gain of broilers, it was noticed that there was a significant increase (P≤0.05) in the rate of weight gain in treatment T5, compared to parameters T1, T2, T3 and T4, which did not differ from each other significantly in the first week of life of the chicks. At the second week of age of the chicks, treatments T1 and T5 were significantly (P≤0.05) superior compared to treatments T2 and T3. There are no significant differences between the coefficients T1, T4 and T5 on the one hand, and among treatments T2, T3 and T4 on the other hand. At the third week of bird life, treatments T4 and T5 were significantly superior (P≤0.05) compared to treatment T1, which was significantly superior (P≤0.05) compared to treatments T2 and T3. The two treatments T2 and T3 did not differ significantly on the one hand, and T4 and T5 treatments on the other hand. At the fourth week, there was no significant effect between all experimental treatments. As for the fifth week of the birds' age, the results indicated a significant superiority (P≤0.05) for treatment T5 compared to treatments T1, T2 and T3. There are no significant differences between the treatments T1, T2, T3 and T4 on the one hand, and the two treatments T4 and T5 on the other hand, when studying the cumulative weight gain rate over the course of the experiment, which amounted to 35 days, treatment T5 showed a significant superiority (P≤0.05)., compared with treatment T4 that was significantly superior (P≤0.05) between treatments T1, T2 and T3. The results show that there are no significant differences between these treatments. The total weight increase rate was 2078.22, 2054.14, 2021.14, 2182.80 and 2316.99 g for treatments T1, T2, T3, T4 and T5, respectively.

Table (2) Effect of added dried bakery with and without yeast to the feed on the weekly weight gain rate (g) of broilers ± standard error.

Treatments	Age (weeks)	Total

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	1	2	3	4	5	
T1	143.22b±2.97	287.33a±0.66	439.00b±9.81	524.67±9.26.	684.00b±10.06	2078.22bc±1.72
T2	149.47b±1.78	268.66b ±10.08	393.00c±6.65	589.67±4.75	653.33b±2.23	2054.14bc±9.68
T3	143.77b±1.65	265.00b±6.35	394.33c±6.56	516.67±13.01	701.67b±7.17	2021.14c±13.64
T4	165.13b±1.28	279.66ab ±2.33	466.00a±4.04	518.00 ±4.58	754.00ab±5.39	2182.80b±23.88
T5	173.32a±178	294.20a±1.56	474.13a±4.82	522.33±2.72	853.00a±4.04	2316.99a±83.65
Sig.	*	*	*	N.S	*	*

T1: control treatment without addition, **T2 and T3** added 10 and 20% dried bakery powder without yeast, **T4 and T5** added 10 and 20% dried bakery powder with 0.04% yeast. * The vertically different lowercase letters indicate that there are significant differences between all treatments under the 0.05 level of significance.

Feed intake

Table (3) shows the effect of added dried bakery with and without yeast to the feed on the weekly feed consumption rate (g) of broilers. The results indicate that there is a significant increase (P≤0.05) in the rate of feed consumption in treatment T5 compared to treatment T1, which is significantly superior at the expense of treatments T2 and T3, there were no significant differences between treatments T4 and T5, treatments T1 and T4 and treatments T2 and T3. The results did not indicate a significant difference between all the experimental treatments at the second and fifth weeks of life of the birds, as well as in the cumulative feed consumption rate throughout the duration of the experiment. At the third week of the birds' life, the results showed a significant increase (P≤0.05) in treatments T4 and T5 compared to treatments T2 and T3, no significant differences were observed between treatments T1, T4 and T5, treatments T1 and T3, and treatments T2 and T3. At the fourth week of age, treatment T3 showed a significant increase (P≤0.05) compared to treatments T1 and T5, no significant differences were observed between treatments T2, T3 and T4 on the one hand, and treatments T1, T2, T4 and T5 on the other hand. The total feed consumption during the experiment period was 3261.94, 3329.93, 3313.01, 3354.49 and 3443.67 g for treatments T1, T2, T3, T4 and T5, respectively.

Table (3) Effect of added dried bakery with and without yeast to the feed on the weekly feed intake (g) of broilers ± standard error.

Treatments	Age (weeks)					Total
	1	2	3	4	5	
T1	194.85b±2.63	373.07±5.13	658.03ab±19.82	793.63b±36.22	1242.34±54.98	3261.94±19.38
T2	178.45c±2.90	287.33±15.00	615.66c±9.25	847.93ab±20.54	1300.54±19.35	3329.93±33.48
T3	185.61c±1.59	379.17±10.32	626.45bc±7.88	931.41a±78.08	1190.35±86.29	3313.01±23.45
T4	199.27ab±2.48	366.38 ±6.02	677.31a±10.23	804.63ab ±7.84	1306.89±40.62	3354.49±41.62
T5	203.33a±1.79	382.46±5.14	674.74a±4.96	788.69b±1.56	1394.43±164.19	3443.67±162.18
Sig.	*	N.S	*	*	N.S	N.S

T1: control treatment without addition, **T2 and T3** added 10 and 20% dried bakery powder without yeast, **T4 and T5** added 10 and 20% dried bakery powder with 0.04% yeast. * The vertically different lowercase letters indicate that there are significant differences between all treatments under the 0.05 level of significance.

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Feed conversion factor

Table (4) indicates the effect of added dried bakery with and without yeast to the feed on the weekly feed conversion factor (g of feed/g of weight gain) for broilers. The results of the first week of chicks' life showed a significant improvement (P≤0.05) in treatments T2, T4 and T5 compared to treatment T3, which showed a significant improvement (P≤0.05) compared to the control treatment, there were no significant differences between coefficients T2, t4 and T5 at the same age. At the second week of the chicks' life, treatments T1, T4 and T5 showed a significant improvement (P≤0.05) compared to treatments T2 and T3. At the same age, there are no significant differences between treatments T1, T4 and T5 on the one hand, and treatments T2 and T3 on the other hand. At the third week of bird life, a significant improvement (P≤0.05) was observed for the two treatments of dry bakery with yeast (T4 and T5), compared with the control treatment, which showed a significant improvement (P≤0.05) compared to the two treatments of dry bakery only (T2 and T3), there were no significant differences between treatments T2 and T3 on the one hand, and treatments T4 and T5 on the other hand. However, at the fourth week of age, the treatments T1, T2, T4 and T5 showed a significant improvement (P≤0.05) compared to the T3 treatment. The treatments T1, T2, T4 and T5 did not show significant differences between them. However, at the fifth week of age, a significant improvement (P≤0.05) was observed in the T5 treatment compared to the T3 and T4 treatments, which showed a significant improvement (P≤0.05) compared to treatment T1 and whose results showed a significant improvement (P≤0.05) compared to treatment T2, there were no significant differences between treatments T3 and T4 at the same age. At the average feed conversion factor throughout the trial period, treatment T5 showed a significant improvement of T3 and T4, compared with the control treatment, the results of which indicated a significant improvement (P≤0.05) compared to the T3 treatment, there were no significant differences between treatments T4 and T5, treatments T1 and T4, treatments T1 and T2, and treatments T2 and T3, the average feed conversion factor for the duration of the experiment was 1.57, 1.62, 1.64, 1.53 and 1.48 g feed/g weight gain for treatments T1, T2, T3, T4 and T5, respectively.

Table (4) Effect of added dried bakery with and without yeast to feed on the weekly feed conversion factor (g of feed/g of weight gain) for broilers ± standard error.

Treatments	Age (weeks)					Total
	1	2	3	4	5	
T1	1.36c±0.075	1.30a±0.017	1.50b±0.020	1.51a±0.088	1.82c±0.011	1.57bc±0.011
T2	1.19a±0.015	1.44b±0.023	1.56c±0.003	1.45a±0.088	2.01d±0.069	1.62cd±0.017
T3	1.29b±0.008	1.43b±0.072	1.59c±0.010	1.79b±0.007	1.70b±0.036	1.64d±0.020
T4	1.20a±0.008	1.31a±0.015	1.45a±0.012	1.55 a±0.003	1.73b±0.008	1.53ab±0.003
T5	1.17a±0.014	1.30a±0.015	1.42a±0.014	1.51a±0.005	1.63a±0.074	1.48a±0.023
Sig.	*	*	*	*	*	*

T1: control treatment without addition, **T2 and T3** added 10 and 20% dried bakery powder without yeast, **T4 and T5** added 10 and 20% dried bakery powder with 0.04% yeast. * The vertically different lowercase letters indicate that there are significant differences between all treatments under the 0.05 level of significance.

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The results of the productive traits represented in body weight, weight gain, feed intake and feed conversion factor indicate a significant improvement in the treatments of using dried baking powder with yeast compared to the control treatment, which showed significantly better results with the use of dried bakery powder without yeast, it may be attributed to the fact that *Saccharomyces cerevisiae* has enhanced the functioning of beneficial microorganisms in the gut of birds, led to an increase in the secretion of digestive enzymes and then the conversion of complex compounds into simple compounds that are easy to digest and absorb. In other words, increasing the readiness of the elements inside the alimentary canal (Al-Zamili, 2015), as well as increasing the production of organic acids that lower the pH value, improves the efficiency of the feed and thus improves the coefficient of digestion, reflected in an improvement in production performance (dos Santos *et al*., 2021; He *et al*., 2021).

Mortality, vitality, and production index

Table (6) shows the effect of added dried bakery with yeast to the feed on mortality (%) and vitality (%) and the production index for broilers, it was noticed that there was a significant increase (P≤0.05) on mortality in treatment T1 compared to treatment T5, there were no significant differences between the treatments T1, T2, T3 and T4 on the one hand, and the treatments T2, T3, T4 and T5 on the other hand, the mortality were 17.78, 15.56, 11.11, 11.11 and 8.89 (%) for treatments T1, T2, T3, T4 and T5, respectively. The same table shows that there is a significant increase (P≤0.05) in the vital percentage of treatment T5 compared to treatment T1, and there are no significant differences between treatments T1, T2, T3 and T4 on the one hand, and treatments T2, T3, T4 and T5 on the other hand. 82.22, 84.44, 88.89, 88.89 and 91.11 (%) for treatments T1, T2, T3, T4 and T5 respectively.It is noticed that there is a significant increase (P≤0.05) in treatment T5 in the productivity index compared to treatment T4, which showed a significant superiority (P≤0.05) compared to treatments T1, T2 and T3, which did not differ significantly between them. 367.37 and 412.17 for the T1, T2, T3, T4 and T5 treatments respectively.

Table (5) Effect of adding dried bakery with and without yeast to the feed on the percentage of mortality (%) and vitality (%) and production index of broilers ± standard error.

Treatments	Mortality (%)	Vitality (%)	production index
T1	17.78a±0.07	82.22b±0.21	316.88c±8.04
T2	15.56ab±0.03	84.44ab±0.17	311.18c±8.16
T3	11.11ab±0.05	88.89ab±0.33	319.71c±13.35
T4	11.11ab±0.04	88.89ab±0.01	367.37b±10.18
T5	8.89b±0.01	91.11a±0.09	412.17a±8.54
Sig.	*	*	*

T1: control treatment without addition, **T2 and T3** added 10 and 20% dried bakery powder without yeast, **T4 and T5** added 10 and 20% dried bakery powder with 0.04% yeast. * The vertically different lowercase letters indicate that there are significant differences between all treatments under the 0.05 level of significance.

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The results indicate the use of dried baking powder with yeast in the feed, led to a significant decrease in the mortality, with a significant increase in the vital percentage, giving the best productivity index rate, the highest level of dried baking powder with yeast at 20% gave the best results in the performance of broilers. The result of an increase in the immune response may be due to an increase in the performance of both cellular and humoral immunity, which reflected positively on the vitality and health of birds, which reduces mortality, it increases the vitality ratio as well as the improvement in body weight (Table 1) and weight gain (Table 2), which improves the food conversion factor (Table 4), reflected positively on the values of the production index, which is an important indicator in evaluating the performance of broiler herds (Al-Gharawi, 2012).

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