The Usage of King Mushroom (*Pleurotus Eryngii*) In Amelioration of Bran Food Value with Its Effect on Physiological and Microbial Traits of Broilers with Oxidation State of Stored Meat

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Abstract:

The experiment had been carried out to investigate the effect of using King mushroom (plentotus eryngii) that had been grown on the wheat bran in order to improve its feed value with its replacement in stead of yellow corn in the broiler rations and its effect on some physiological and microbial traits. The experiment had been conducted by two stages, the first of them was Laboratorial that included growing of the spawn on the wheat bran, then the Wheat bran had been dried and all the chemical analysis had been conducted on into evaluate its feed value. The second stage had been Carried out in the Animal Production Department. Abugraib to investigate the effect of using the fermented wheat bran by the spawn in the broiler diets with its effect on the physiological, microbial, immunological and oxidation indices of the stored broiler meat during the period 1 March 2025 until 5 April 2025. A total of 160, One day old broiler chicks had been used in this experiment, those chicks were alloted into four equal treatments, each treatment involved 40 chicks, and each treatment involved four replicates, 10 chicks for each replicate.Chicks had been fed on the basal diet in the first treatment.Meanwhile the yellow corn had been replaced by the spawn fermented wheat bran at percentages of 5, 10 and 15% respectively in T2, T3 and T4 respectively.Blood samples had been collected from the birds at

the end. of the experiment at the 35 day of age to estimate the biochemical traits in the broiler blood as well as the antibody titer against Newcastle and Gumboro Disease. More over the intestinal Contents of the broiler birds had been collected to estimate the logarethmic numbers of the intestinal microbes and the oxidation state of the frozen broiler ment. Results indicated a significant reduction (P<0.05) of blood cholesterol, Triglycerides, LDL, VLDL in T2, T3 and T4 as compared with the Control treatment. HDL had been significantly elevated (P<0.05) at T2, T3 and T4 in Comparison with the Control treatment. Results also revealed a reduction of the pathogenic bacteria in T3 and T4 in Comparasion with T1 and T2 with a significant increase (P<0.05) of the antibody titer against ND in Ta and T in Comparasion with T2 and T4. A significant reduction (P<0.05) had been noticed in the peroxide value and Malonaldehyde as well as the free fatty acids in the broiler meat in T2, T3 and T4 in Comparasion with the Control treatment before and after storage at 30 days of freezing. It was concluded that the oyster mushroom spawn in the wheat bran caused a significant change of the fat profile, immune response as well as reduction of the peroxide value of the broiler meat.

Keywords: Broiler, Pleurotus eryngii, spawn. fat profile

Introduction

Poultry industry is considered one of the important economical resources in provision of protein rich food that contributes in food security (Adaszynska, et al. 2025), but this industry is suffering from difficulties including the increased prices of the food element that had been included in the formation of those rations since those food elements are imported so the food is considered the highest cost nearly 65-70% of the total production cost, so it is important to find solutions to use food elements that are nontraditional with the lowest cost with improvement of its food value (Abara and Alemn, 2025). Wheat bran and Corn cobs as well as the reminants of feild Crops and industrial byproducts that are chemically treated or fermented by the mushroom to increase its biological value (Katu, et. al. 2025; AL Aboodi, 2022) So it is necessary to look for alternative sources to overcome the Leakage of the food materials including the benefit of recycling the agricultural byproducts in order to produce Untraditional food. The agricultural

sector contributed to a large extent in producing those byproducts on the World level but the bad management of those byproducts may cause ecopollution (Kani, 2021; Mishra and Satapathy, 2021). The Last few years had witnessed that nutritionists especially the poultry nutritionists had looked for alternative food resources of no adverse effect on the poultry health (Laudadio et al. 2015; Dham et. al. 2015). One of the worst effect of the wheat bran is its low digestibility with high contents of fibers but it is Characterized by high protein Contents that is rich in amino acids, so it can be considered as a partial alternative for some grains that are used in the rations. Moreover the secondary products of wheat are considered a good source of phytase enzyme that acts to increase the availability of phosphorous (Lessen and Summers, 2008).

The reduction of the Volumetric density of wheat is Considered a main limiting factor in using in poultry rations due to its big volume space in the digestive tract of the bird, this will negatively affed getting rid of the main nutritional elements to plug its need, for this reason it is not advising to use it in the starter rations of chicks (Alyassin and Abdul Abass, 2010). Different methods had been done to overcome all of those negative effects including treatments such as physical and chemical methods of treatments had been done to treat the materials of the high fiber contents such as exposure to heat, pressure, toasting and addition of enzymes in order to improve the feed value with increasing its digestability (AL-Tayat, 2018). Fermentation process induced increased protein percentage as well as amino acids with reduction of carbohydrate percentage with its conversion to nitrogenous sources (Ali, et-al-2019), so fermentation becomes one of the successful nutritional method to overcome this problem Concerning the non saccharide Carbohydrates with phytic acid content (Garcia, et.al.2012). Furthermore, several beneficial traits are produced due to fermentation. Mushrooms had been used in fermentation of food materials of high fiber contents due to its content of analytical enzymes such as cellulase. The king oyster mushroom is one of those importand mushrooms due to its high content of protein as well as antioxidants and a antimicrobial agents.

On the other hand it acts on analysis of Lignin due to its content of an enzymatic system specific consisted of Lignin peroxidase and Lacease, it produces enzymes that lysis cellulose and hemcellulose, so it plays an Important role in bioanalysis of plant byproducts, this aids in using media for growing plentotous eryngii as aprimary material in feeding ruminants and poultry and

it is generally Considered as Safe (GCAS). Likewise it increases the digestability in the birds. Bander and Al-Azawy (2023) had mentioned that numbers of different types of mushroom Like Lion's Mane mushroom had apositive impact on improving the gut health of the birds. Mushroom had been used in poultry feeding in the latest years and had become as an important food additives as growth promotors due to its neutroceaitical value (Camay, et. al., 2016).

This study aimed to investigate the assessment of the fermented wheat bran by the spawn of plentoteds eryngii with its effect on improvement of its food value with its partial replacement of the yellow corn at different rates with its effect on some physiological, microbial, immunological and oxidation state of frozen poultry meat.

Materials and Methods:

The experiment had been carried out by two stages, the first was laboratorial, it induded the growing of the native breed of the King mushroom (pleutotus eryngii), the Spawn was produced by fermentation on the wheat bran, all the stages of the native King mushroom with the chemical analysis on the wheat bran before and after fermentation by the native King mushroom was done in the quality Control Department/Ministry of Agriculture table (1). Meanwhile the amino acids, fatty acids, minerals and, Vitamins with and antioxidants had been done done in the Food Department/Technology and science Ministry as shown in table (2,3,4,5,6 and 7).

Table 1: Chemical analysis of wheat bran before and after fermentation by the spawn

Element	**Wheatbran before fermentation**	**Wheatbran after fermentation**
Carbohaydrats%	57.6	61.18
Crude fibers%	19.5	16.2
Crud protein%	13.3	14
Moisture	5	4.84
Ash %	2.1	2
Fat%	2.5	1.15

Kcl/kg	3667	3668

Table 2 Type and concentration of mycotoxins in fermented wheatbran

Mycotoxins	**Concentration PPb**	**Permissible limits PPb**
Aflatoxin ppb	2.7	20
Tricothiocynin t2 ppb	64	100
Ochratoxin ppb	1.2	5

Table 3: Active materials in the fermented wheat bran

Active material	**mg /100gm**
Phenols	325.6
Flavonoids	178.0

Table 4: Metalic elements in where the fermented wheatbran was produced by the local spawn.

Element	**%**
Calcium%	2.66
Phosphorous%	0.42
Selenium%	0.32

Table 5: Vitamins in the fermented wheat bran by the spawn

Vitamin	**mg /kg**
E	45.9
B2	9.4
B3	8.9
B5	2.9
B6	7.4
B9	5.4
B12	0.24
Vitamin A(I.U)	1524

Table 6: Amino acids in the fermented wheat bran by the spawn

Amino acid	**%**
Glutamine	15.90
Alanine	13.65
Methionine	13.60
Threonine	13.44
Phenyl alanine	13.00
Serine	10.80
Glysine	9.33
Arginine	9.12
Aspartic	8.90

Histidine	8.77
Proline	8.70
Isoleucine	8.00
Valine	7.44
Leucine	7.12
Lysine	6.80
Tyrosine	5.90
Cysteine	4.22

Table 7: Fatty acids in the wheat bran fermented by the spawn

Fatty acid	**%**
Oleic	**4.15**
Linoleic	**3.05**
Linolenic	**0.22**
Arachidonic	**0.052**
Palmitic	**1.25**

Second stage:

The second stage of the experiment had been carried out in the poultry farm/College of Agriculture during the perred of 1/3/2025 till 5/4/2025, it had been lasted for 35 days. Atotal of 160, one day old broiler chicks (OS 308) had been used in this experiment, those chicks had been alloted into four equal treatments (40 chicks/treatment) and each treatment involved four replicates (10 chicks/replicate).Treatments were arranged as follow:

Table 8: The percentage of the comporents and the chemical composition of the Starter diet

Components	(1-14day)			
	T1	T2	T3	T4
Yellow corn	45	40	35	30
Soya meal (48% protetein)	34.5	33.7	32.9	32
Wheat	10	11	12	134
Protein concentrate	5	5	5	5
Wheat+mushroom	0	5	10	15
Sun flower oil	2.4	2.2	2	1.7
Lime stone	1.3	1.3	1.3	1.3
Di phosphate calcium	0.9	0.9	0.9	0.9
Vitamins	0.5	0.5	0.5	0.5
Lysine	0.2	0.2	0.2	0.2
Methionine	0.1	0.1	0.1	0.1
Nacl	0.1	0.1	0.1	0.1
Total	100	100	100	100
Chemical components				
ME(Kcl/kg)	2983.15	2992.73	3002.31	3000.45
Crude protein %	23.02	23.04	23.05	23.03
Crude fiber %	2.8	3.5	4.2	4.9
Methionine+ cystine	1.09	1.07	1.04	1.06
Lysne%	1.44	1.41	1.37	1.45
Calium%	0.97	0.96	0.96	0.96
Phosohor%	0.56	0.55	0.55	0.54

*Vitamins mix Each kg contains 500IU vit A, 600IU vit D3 10mg vit E, 2mg vit k3, 2mg vit B1, 2mg vit B2 2mg B6, 5 mg B12, 15mg vit C , 500µg Folic acid

** The chemical analysis of the feed was estimated according to NRC (33).

***Di phosphate calcium Spanish production 22% Ca and P18%

****Soya meal of Argentinian origin with a protein content of 48% and 2440 calories/kg.ME

T1Control T2,T3,T4 replacement fermented wheatbran by the spawn instead of the yellow corn at a rate of 5% 10% 15%

Table 9: The percentage of the comporents and the chemical composition of the Grower diet.

Components	(14-24)			
	T1	**T2**	**T3**	**T4**
Yellow corn	49	44	39	34
Soya meal (48% protetein)	30.7	30	29	28
Wheat	10	10.5	12	13.5
Protein concentrate	0	5	10	15
Wheat+mushroom	5	5	5	5
Sun flower oil	3	3	2.5	2
Lime stone	1.2	1.2	1.2	1.2
Di phosphate calcium	0.5	0.5	0.5	0.5

Vitamins	0.3	0.3	0.3	0.3
Lysine	0.1	0.1	0.1	0.1
Methionine	0.1	0.1	0.1	0.1
Nacl	0.1	0.1	0.1	0.1
Total	100	100	100	100
Chemical components				
ME (Kcl/kg)	3078.43	3092.85	3086.15	3079.45
Crude protein %	21.59	21.60	21.58	21.56
Crude fiber %	2.7	3.4	4.1	4.8
Methionine+ cysteine	0.96	0.93	0.90	0.87
Lysne%	1.34	1.31	1.27	1.23
Calium%	0.83	0.82	0.82	0.82
Phosohor%	0.48	0.47	0.47	0.47

*Vitamins mix Each kg contains 500IU vit A, 600IU vit D3 10mg vit E, 2mg vit k3, 2mg vit B1 , 2mg vit B2 2mg B6, 5 mg B12, 15mg vit C , 500µg Folic acid

** The chemical analysis of the feed was estimated according to NRC (33).

***Di phosphate calcium Spanish production 22% Ca and P18%

****Soya meal of Argentinian origin with a protein content of 48% and 2440 calories/kg.ME

T1Control T2,T3,T4 replacement fermented wheatbran by the spawn instead of the yellow corn at a rate of 5% 10% 15

Table 10: The percentage of the comporents and the chemical composition of the Finisher diet

	(24-35)

Components	**T1**	**T2**	**T3**	**T4**
Yellow corn	50	45	40	35
Soya meal (48% protetein)****	24	24	23.3	24.8
Wheat	16	16	17	15.7
Protein concentrate	5	5	5	5
Wheat+mushroom	0	5	10	15
Sun flower oil	2.6	2.6	2.3	2
Lime stone	1.1	1.1	1.1	1.09
Di phosphate calcium***	0.5	0.5	0.5	0.5
Vitamins*	0.4	0.4	0.4	0.4
Lysine	0.15	0.2	0.2	0.2
Methionine	0.15	0.2	0.2	0.2
Nacl	0.1	0.1	0.1	0.1
Total	100	100	100	100
Chemical **components				
ME(Kcl/kg)	3105.97	3115.55	3118.57	3122.25
Crude protein %	19.51	19.53	19.59	19.58
Crude fiber %	2.7	3.4	4.1	4.8
Methionine+ cysteine	0.95	0.92	0.89	0.87
Lysne%	1.22	1.19	1.16	1.12
Calium%	0.75	0.75	0.75	0.74

Phosohor%	0.46	0.45	0.45	0.44

*Vitamins mix Each kg contains 500IU vit A, 600IU vit D3 10mg vit E, 2mg vit k3, 2mg vit B1 , 2mg vit B2 2mg B6, 5 mg B12, 15mg vit C , 500µg Folic acid

** The chemical analysis of the feed was estimated according to NRC (33).

***Di phosphate calcium Spanish production 22% Ca and P18%

****Soya meal of Argentinian origin with a protein content of 48% and 2440 calories/kg.ME

T1Control T2,T3,T4 replacement fermented wheatbran by the spawn instead of the yellow corn at a rate of 5% 10% 15%

First Treatment (T1): Control treatment, a basal diet was used that contained 100% yellow.corn-

Second treatment (T2): A partial Replacement of fermented wheat bran by the splawn 5% instead of the yellow corn in the basal diet

Third treatment (T3): A partial replacement of ferment yellow corn the spawn 107. instead of the yellow corn by in the basal diet.

Fourth treatment (T4): A partial replacement of fermented wheat bran by the spawn 15% instead of the yellow coru in the basal diet.

Chicks fed adlibitum in all treatments along the experiment and three types of rations are used in feeding that included starter, grower and finisher rations Rations had been calculated according to (NRC,1994)as shown in table 8, 9 and 10.

Blood Samples had been collected from the wing vein of the birds of the end of the experiment to evaluate the physiologicaltests that had been involved in the study as follows:

cholestrol (gm/100ml) according to (Richmond, 1973).Triglycerides according (gm/100ml) (Toro and Acheerma/1975).

Hig Density Lipoprotein, HDLgm/100ml) according To (War inch and Wood, 1995).

Very Low Density Lipoprotein,VLDL (gm/100ml) according to(Fridewald et.al. 1972).

Low Density lipoprotein, LDL (gm/100m) accordingto (Grundy et.al. 2004)

Immunological tests had been done in order to evaluate the antibody titer against ND and IBD (Syndr, et-al-1984). Broiler meat had been stored by freezing for 30days and peroxide value had been estimated according to (Egan, 1981) and Thiobarbituric acid according to (witte, 1970). Statistical Analysis System (SAS, 2018) had been usat used to analyse the data to show the effect of different treatments on the studied traits of the broilers according to Completely Randomized Design (CRD. Significant differences had been done between means by using Duncan Multiple Range Test (Duncan, 1955).

Results:

Results of table 11 indicated that replacement of the wheatbran at different percentage had a significant effect on lipid profile of broiler birds as different treatments ,so there was a significant reduction ($p<0.05$) of blood cholestrol in the replacement treatment T2, the lowest value of cholestrol was recorded in T3 in Comparasion with T1 (Control) which didn't differ from T4 Triglycerides was significantly reduced ($p<0.05$) in T2 and T3 as Compared with the Control(T1) which didn't differ with T4, the Low Density Lipoprotein (LDL) and the very low Density lipoprotein (VLDL) were reduced significantly in T2, T3 and T4 as compared with the control treatment (T1). Meanwhile the High Density Lipoprotein (HDL) was significantly elevated ($P<0.05$) in T3 and T4 as Compared with the Control treatment T1,) and it didh't differ from T2.

Table 11: Effect of replacement the fermented wheat brea by the spawn on lipid profile in the experimental experime treatment

Traits	Treatment				**Significant**
	T1	T2	T3	T4	
Cholestrol	96.45±2.50a	77.08±1.34c	87.65±2.79b	91.03±3.41ab	*
Triglyceides	112.13±7.24a	75.10±4.95b	77.08±4.44b	91.32±4.27ab	*

LDL	24.06±2.24a	11.37±1.72b	14.14±2.14b	16.04±2.23b	*
HDL	49.96±0.17b	50.69±1.54b	58.09±2.77a	56.73±1.23a	*
VLDL	22.43±1.45a	15.02±0.99b	15.42±0.89b	18.27±0.85b	*
GOT	5.90±0.08b	6.46±0.48ab	5.94±1.09b	8.00±0.39a	*
GPT	22.95±1.25a	11.66±0.90bc	5.53±0.36c	16.13±1.49b	*

T2,T3,T4 replacement fermented wheatbran by the spawn instead of the yellow corn at a rate of 5% 10% 15%

Different letters mean significant differnces

*= p< 0.05

Table 12 indicated the antibodytiter against Newcastle disease, There are no ut differences in between treatments but Significant the antibodytiter against the Infectious Bursal Disease(IBD) was significant (p<0.05) so T4 had superimposed on other treatment whichare T_1, T2 and T3. other

Table 12: Effect of replacement of fer mented wheat bran by the Spawn instead of yellow Corn on antibody titre against ND and IBD Mean±se)

Traits	Treatment				Significant
	T1	T2	T3	T4	
ND	243.50±16.64b	3822.98±1314.75ab	7439.75±2502.49a	809.75±164.42b	*
IBD	55.50±3.20	17.75±15.10	33.00±23.36	25.75±4.21	Ns

T2,T3,T4 replacement fermented wheatbran by the spawn instead of the yellow corn at a rate of 5% 10% 15%

Different letters mean significant differnces

*= p< 0.05

partial replacement of fermented wheat bran (Table 13) Caused reduction of numbers of pathogenic bacteria E. Coli in the intestines of the birds, so numbers of the pathogenic bacteria had significantly reduced (P<0.05).

Table 13: Effect of substitution of fermented wheat bran instead of the yellow Corn on numbers of pathogenic and nonpathogenic bacteria (Mean±Se)

Traits	Treatment				Significant
	T1	T2	T3	T4	
ECOLI	6.300±0.017a	5.630±0.246b	5.413±0.135b	5.655±0.297b	*
LACTOBACILUUS	4.633±0.037	4.823±0.305	5.149±0.205	4.414±0.298	Ns

T2,T3,T4 replacement fermented wheatbran by the spawn instead of the yellow corn at a rate of 5% 10% 15%

Different letters mean significant differnces

NS : nan Significant

*= p< 0.05

Malondehyde is an index used to evaluate the causative stress tissues, so the results of fermentation of the wheat bran at different percentages had an important effect on preventing oxidation (Table 15), a significant difference (P<0.05) in the level of this index, so it was reduced in the first day to become 0.031,0.024, 0.023 and 0.024 mg/kg in T2 T3 and T4 and it was 6.33 ml equiv./100gm in the Control (T1). More over there were significant differences (P<0.05) in the level of Malondehyde index at the 30 day after freezing, so it those values reduced to 0.052, 0.041 and 0.035 in T2,T3 and T4 and it was 0.062 mg/kg in the Control treatment. Peroxide value was significantly reduced (P0<0.05) during the first day of freezing, it was 3.49 ,3.47 and 3.49 equiv/100gm in the fat in T2, T3 and T4, and it reduced significantly (P<0.05) at day 30 to become 5.74, 4.93 and 4.51 equiv/100gm in T1, T2 and T4 respectively

and it was 6-38mladote/100gm in the Control (T1).Results of table 15 indicated a significant reduction of free fatty acids in the broiler ment that fed fermented wheat bran before freezing to become 0.22, 0.21 and 0.21% in T2, T3 and T4 and it was 0.29% in the control (T1), and during the day 30 the differences are significant (p<o.o5) and it was 0.44, 0.40 and 0.33% in T2, T3 and T4 and it was 0.53%. in the control treatment (T1).

Table 14: Effect of replacemeut of formented wheat bran by spawn on oxidation indices befor freezing and after 30 days infreezing (mean ± se)

Storage period (day)					\ significant
	T1	T2	T3	T4	
	Malondialdehyde mg/kg				
0 day	0.031±0.001a	0.028±0.002b	0.025±0.001c	0.024±0.001c	*
30 day	0.062±0.001a	0.044±0.001b	0.037±0.001bc	0.031±0.001c	*
	Peroxide Value ml eqiuv/100mg				
0day	3.83±0.01a	3.53±0.01b	3.51±0.01bc	3.48±0.01c	*
30 day	6.32±0.01a	5.06±0.02b	4.33±0.01c	4.01±0.01c	*
	Free Fatty Acids%				
0 day	0.31±0.01a	0.28±0.00b	0.28±0.01b	0.25±0.01c	*
30day	0.52±0.01a	0.41±0.01b	0.32±0.01bc	0.28±0.01c	*

T2,T3,T4 replacement fermented wheatbran by the spawn instead of the yellow corn at a rate of 5% 10% 15%

Different letters mean significant differnces

NS : nan Significant

*= p< 0.05

The blood physiological parameters are correlated with the healthy state, they were bioindices for the food and physiology of animals especially domestic birds (Abd El-Hack et al., 2017).

Results indicated that reduction of cholestrd, Triglycerides (Ta), Low Density lipoprotein (LDL) with improvement of High Density Lipoprotein (HDL), this significant reduction($p<0.05$) of Cholestrol and LDL maybe due to presence of biological materials in the fermented wheat bran since the King mushroom Contains B-glucan that is connected with the bile salts in the bird intestines Leading to increased excretion out of the body so it increases the utelization of cholestrol in the liver to Componsate it causing reduction of its plasma level. Moreover the mushroom Contains components like Statins with probability of precipitation in the fermented Wheat bron that act on inhibition of HMG-CoA Reductase enzyme that is responsible on cholestrol synthesis in the liver Additionally the wheat bran contains active materials such as phenols (Table3), flavonoids and Ergothionine that decrease the oxidative stress in the liver, so it is considered as antioxidant that ameliorates the liver efficiency in regulation of fat metabolism preventing its presipitation in the tissnes (Seid, 2023). Increased antibody titer against Infections Bursal Disease (IBD) may he attributed to the immunoglobulins in the blood of the breilers so the mushroom is considered as Immunomodulatory that plays an important role in enhancing the immunity, this improvement may be also. attributed to the fermented wheat bran used in the ration at different percentages because the Wheat bran contains some vitamins that are necessary to enhance immunity as shown in table(5) with the increased the biological value of the protein in the wheat bran with its contents of amino acids (table6) that are essential to improve the bird health, this is positively reflected on amelioration of the immune state of the birds. The use of fermented wheat bran by the spawn in the ration Led to reduction of the pathogenic bacteria and this may be due to the content of the wheat bran of active materials such phenols and B-glucans that act in weakening the bacterial cell wall and it decreases its adhesion with the intestinal walls of the birds.Likewise it activates the phagocytic cell in the intestines as antibacterial for pathogenic bacteria without affecting the beneficial bacterial (Azad, et al. 2026), the bacterial numbers of those bacteria is an important index that indicates the birds health (shamsi, et al. 2015). Thamer, et.al.(2026) indicated the reason of improvement of the morphology of the layers intestines due to the presence of biologicaly active components in the growing hyproducts of Hishtaki mushroom such as phenols, Glycosides, flavonoids and tanins.The significant redaction of Malon aldehyde, free fatty acids and peroxide value of the broilers fed on rations Contain fermented wheat bran at different percentages after meat storage for 30days by free Zing may be due to the effect of vit E-selenium in the fermented wheat bran, this Compound is the basic

component for the Glutathione peroxidase, this enzyme inhibit the free radicals before attaching the fat in the meat as well as it protects the cell membrane of the broiler meat which is Consisted of high percent of unsaturated fatty acids. Selenium acts with Vitamin E in a synergistic mode in preventing formation of free radicals in the cell membranes.This Synergism maintain the integrity of cell walls thus preventing meat oxidation during freezing.Further more the wheat bran Contains phenolic components that donate H to the free radical making it non harmful While the phenol itself is converted to relatively Constant radical not affecting the meat.The meat Contain minerals such as Fe and Copper that act promoting factors in hasting oxidation process to a large extent, phenols are connected with such minerals forming constant chemical complexes preventing the initiation of oxidation, this leads to elongate the virtual meat age. Inhibition of oxidative enzymes are found in the meat natural enzymes such as Lipoxygenase may contribute in fat degredation and oxidation-phenols are capable to be connected with such enzymes modifying its shape or obscuring its active location, thus it ceases its harmful effect .Reduction of the oxidation indices in the frozen broiler meat may be due to effect of fermented wheat bran that contains active materials such as phenols (EKunstitan et. al. 2021) who used the oyster mushroom in reduction of Thiobarbituric acid with the increased activity of Glutathione peroxidase, this Positively reflected on steady state of meat tissues against fat tissues, thus it is possible to elongate the meat quality. The significant reduction of Molondehyde maybe attributed to the fermentation by the king mushroom spawn because this mushroom possese bilogical components as antioxidants (Table 2,3 and4) . Moreover the presence of Glutathione and seleniun in the mushroom gives antioxidants features (Bhambry et-el., 2022). Table (5 and 6) Confirmed the steady state of the frozen meat of the broilers.

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