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CHANGES IN CAMEL AND CATTLE MEAT DURING CHILLING PRESERVATION

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ABSTRACT

The intent of the current study was to assess the changes concerning beef and camel meat during chilling at 4 °C and their role in shelf life of camel and cattle meat. The studied parameters included sensory (colour, odour, consistency and appearance). Microbiological characteristics (total bacterial count (TBC), yeast and mould count, coliforms and *Staph. Aureus* counts) and chemical parameters (Potentiality of hydrogen (pH), Thiobarbituric Acid (TBA), Total Volatile Nitrogen (TVN), Peroxide value (PV), Glutathione peroxidase (GSH-Px), catalase (CAT), Fractionation of amino acid, Fractionation of fatty acid and Free Fatty Acids (FFAs)). The results revealed that the sensorial quality of fresh cattle meat was acceptable until at 6 Th day but still at 8 Th day of camel meat. The microbiological quality indicated that the validity of cattle meat at 8 th day and camel meat at 10 th day for all mentioned microbial parameters. Chemically, the results were evaluated for cattle meat until the 8 Th day and camel meat at 10 th day for pH., TBA, TVN, PV, Glutathione peroxidase, Catalase and free fatty acids, as well as fractionation of amino acids and fatty acids. In summary, chilling preservation at 4 °C enhanced fresh camel meat shelf life for 8 days and fresh cattle meat shelf life for 6 days without undesirable and detrimental effects on its sensory acceptability.

Keywords: Cattle meat, Camel meat, Chilling, Sensory evaluation, Microbiological characteristics and Chemical Changes.

INTRODUCTION

Meat is considered as one of the most nutrient-dense food material that provides ideal conditions for microbial growth and defines its perishable nature (Saucier, 2016). Bacteria can cause disease in humans (pathogenic bacteria), such as *Staphylococcus aureus* that is considered one of the most significant foodborne hazards from fresh meat (Birhanu *et al.*, 2017). The quality of meat is determined by its chemical configuration, physical properties and sensory attributes (Probola and Zander, 2007). It is the main source of high quality meat for Egyptians is cattle meat because of their considerable contents of proteins, essential amino acids, vitamins and iron (Badawi, 2008). On the other hand unlike other types of animal meat, camel meat is healthy because of lack of fat and cholesterol in the fat (Abrhaley and Leta, 2018).

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The purpose of the current study was to assess the changes of beef and camel meat during chilling and their role in shelf life of camel and cattle meat.

MATERIALS AND METHODS

1. Collection of samples:
Eighty camel and cattle meat samples (40 of each) at shoulder area were selected randomly from several butcher shops in Cairo governorate through December 2020 to September 2021. The Samples kept in an icebox and transferred directly to Banha laboratory where the sensory, bacteriological and chemical analyses were performed.

2. Sensory evaluation (Fik and Fik, 2007):
A Six-member panel adequately trained and inspected in sensory sensitivity evaluated sensory properties of raw meat samples. Samples that represented of the tested meat were casually choose and prepared in the Lab on porcelain plates. Panel members evaluated the following properties: color, odor, appearance and consistency. The scores of sensory quality were 5, 4, 3, 2, and 1 matched with the beef and camel meet qualities evaluated as very good, good, acceptable, unacceptable, and bad, respectively.

3. Bacteriological examination:
*** Preparation of samples (ISO 4833-1, 2013):**
Under aseptic conditions, Twenty-five grams of the sample were weighted and carried into a sterile flask that have 225 ml of sterile peptone water (0.1%). The Homogenization of the content of the flask occurred for 3 minutes at 14000 rpm. The Homogenization was performed by Homogenizer (Warszawa homogenizer, MPW 309 model, Poland). One ml from the homogenate carried into a separate tube containing 9 ml of sterile peptone water (0.1%) then preparation of tenfold serial dilutions performed. meat samples that were prepared, subjected to the following examinations:

3.1. Mesophilic count (ISO 4833-1, 2013):
The Aerobic Plate Count (APC) per gram was calculated, incubation at 35°C for 48 hours and each count was recorded separately.

3.2. Psychrotrophic count (ISO 4833-1, 2013):
The same technique adopted for mesophilic count was performed but the incubation at 7°C for 10 days. The psychrotrophic count/g was calculated and recorded.

3.3. Total coliforms count:
The procedures recommended by ISO 4832 (2006) using Violet Red Bile agar medium (Himedia, M049A) were done, the plates were then calculated and determination of average number of colonies was performed.

3.4. Enumeration of *S. aureus* count (FDA, 2001):
The developed colonies (shiny black colonies) on Baird Parker Agar Base (HiMedia, M043) plates were enumerated as presumptive *S. aureus* and count/g was calculated.

3.5. Mold and yeast counts (ISO, 2008):
One ml from serial dilutions prepared, poured and mixed with 15 ml of melted and tempered Dichloran Rose Bengal Chloramphenicol (DRBC) agar containing chloramphenicol 0.05 mg/ml, Plates were examined for the "star-shape" mold growth, which enumerated and recorded as total mold count/g. In case of yeast, the colonies were separately counted by the naked eye and recoded as total yeast count/g.

4. Chemical examination:
4.1. PH measurement (Pearson, 2006):
The pH measurement was performed by using an electrical pH meter (Bye model 6020, USA).

4.2. Estimation of Thiobarbituric Acid Number "TBA" (EOS: 63-10/2006):
The measurement of sample absorbance was performed by using Spectrophotometer

(UNICAM969AA Spectronic, USA) at wave length 538.

TBA value= absorbance of sample x 7.8 (malonaldehyde (mg) /Kg)

4.3. Estimation of Total Volatile Nitrogen "TVN" (EOS: 63-9/ 2006):
TVA was calculated from the following formula:
TVN/l00g = (ml$_s$ H_2 So_4 n 0.1 for sample – ml H_2 So_4 n 0.1 for Blank) x 14 mg/100g

4.4. Determination of Peroxide value (Asakawa and Matsushita, 1978):
Calculation of the peroxide value PV for all samples was performed from the following formula:

PV = (V_1 – V_0) x T x 1000 / m (mille equivalent available oxygen/kg)

5.1. Estimation of Glutathione "GPx" (Wang *et al.*, 2011):
Examination of the samples was performed with commercially available GPx kits (Randox, Crumlin, UK), 1 unit of GPx activity was calculated as amount of enzyme that converts 1 μmol of NADPH to NADP+ per minute. The GPx activity expressed as unit/mg protein.

5.2. Estimation of catalase activity (CAT):
Analysis of catalase activity (CAT) in the meat tissue was according to the method described by Fang *et al.* (2011), 1 unit of CAT defined as the enzyme amount that decomposes 1 mol H2O2 per minute at 25°C. The activity of Hepatic CAT expressed by U/mg protein.

6. Fractionation of fatty acid:
Estimation of fatty acids was performed in meat by An Agilent 1200 system GC (Germany) consisting of a quaternary pump G1311A, a vacuum degasser G1322A, an automatic injector G1329A with sample tray G1330A, a column thermostat G1316A, a fluorescence detector G1321A, a multiple wave detector G1365B and integration software. The test performed at faculty of Banha veterinary medicine in Banha laboratory. (ChemStation G2170AA and G2180AA) was used complying with Aura *et al.* (1995).

7. Fractionation of amino acids:
Application of amino acids fractionation performed by Gas Chromatography (GLC) A 6890 Agilent technologies, Santa Clara, CA, USA, as mentioned by Mabbott (1990) for fractionation of amino acids. The test performed at faculty of Banha veterinary medicine in Banha laboratory.

8 Free Fatty Acids determination (Brake and Fennema, 1999):
Recording of FFA values expressed as percentage of oleic acid as follow:

% oleic acid= (ml NaOH X NaOH normality X 28.2) /weight of sample

Statistical Analysis:
The acquired results statistically evaluated by application of student t-test agree with Feldman *et al.* (2003).

RESULTS

Table 1: Sensorial scores of the examined samples of cattle meat during chilling storage at 4°C (n=40).

Character / Storage time	Color (5) Mean ± S.E*	Odor (5) Mean ± S.E*	Appearance (5) Mean ± S.E*	Consistency (5) Mean ± S.E*	Overall (5) Mean ± S.E*	Sensorial Quality
Zero time	4.5 ± 0.3	4.4 ± 0.2	4.4 ± 0.3	4.7 ± 0.3	4.5 ± 0.4	Very good
2 days	4.2 ± 0.2	4.0 ± 0.1	4.1 ± 0.3	4.2 ± 0.2	4.1 ± 0.2	Good
4 days	4.0 ± 0.2	3.9 ± 0.2	4.0 ± 0.1	4.2 ± 0.1	4.0 ± 0.3	Good
6 days	3.1 ± 0.2	2.8 ± 0.2	3.1 ± 0.1	3.2 ± 0.1	3.1 ± 0.2	Acceptable
8 days	2.3 ± 0.1	2.2 ± 0.1	2.0 ± 0.2	2.5 ± 0.2	2.2 ± 0.2	Unacceptable
10 days	1.2 ± 0.1	1.2 ± 0.1	1.4 ± 0.1	1.6 ± 0.1	1.4 ± 0.1	Bad

Table 2: Sensorial scores of the examined samples of camel meat during chilling storage at 4°C (n=40).

Character / Storage time	Color (5) Mean ± S.E*	Odor (5) Mean ± S.E*	Appearance (5) Mean ± S.E*	Consistency (5) Mean ± S.E*	Overall (5) Mean ± S.E*	Sensorial Quality
Zero time	4.8 ± 0.2	4.8 ± 0.4	4.7 ± 0.2	4.5 ± 0.2	4.7 ± 0.4	Very good
2 days	4.5 ± 0.1	4.4 ± 0.3	4.5 ± 0.3	4.1 ± 0.2	4.4 ± 0.3	Good
4 days	4.1 ± 0.2	4.3 ± 0.2	4.3 ± 0.1	4.0 ± 0.2	4.2 ± 0.3	Good
6 days	4.0 ± 0.2	4.1 ± 0.2	4.2 ± 0.3	3.8 ± 0.1	4.0 ± 0.2	Good
8 days	3.4 ± 0.1	3.0 ± 0.1	3.3 ± 0.2	3.1 ± 0.1	3.2 ± 0.2	Acceptable
10 days	2.5 ± 0.1	2.4 ± 0.1	2.5 ± 0.1	2.2 ± 0.2	2.4 ± 0.1	Unacceptable
12 days	1.8 ± 0.1	1.5 ± 0.1	1.6 ± 0.1	1.4 ± 0.1	1.5 ± 0.1	Bad

4.5-5: Very good **4-4.5:** Good **3-4:** Acceptable **2-3:** Unacceptable **1-2:** Bad

Table 3: Statistical analytical results of microbial counts (cfu/g) in the examined samples of cattle meat during chilling storage at 4°C (n=40).

Storage time	Cattle meat (Mean ± S.E)					
	Total mesophilic count	**Psychrotrophic count**	**Yeast count**	**Mold count**	**Coliform count**	***S. aureus* count**
Zero time	$1.08\times10^{4}\pm 0.25\times10^{4}$ a	$8.53\times10^{3}\pm 1.40\times10^{3}$ a	$4.68\times10^{2}\pm 0.56\times10^{2}$ a	$2.21\times10^{2}\pm 0.16\times10^{2}$ a	$9.46\times10^{2}\pm 1.73\times10^{2}$ a	$4.14\times10^{2}\pm 0.52\times10^{2}$ a
2 days	$7.39\times10^{4}\pm 1.14\times10^{4}$ b	$3.77\times10^{4}\pm 0.49\times10^{4}$ b	$9.02\times10^{2}\pm 0.76\times10^{2}$ b	$7.66\times10^{2}\pm 0.81\times10^{2}$ b	$6.85\times10^{3}\pm 0.92\times10^{3}$ b	$1.96\times10^{3}\pm 0.27\times10^{3}$ b
4 days	$2.56\times10^{5}\pm 0.33\times10^{5}$ c	$1.02\times10^{5}\pm 0.18\times10^{5}$ c	$2.83\times10^{3}\pm 0.37\times10^{3}$ c	$1.35\times10^{3}\pm 0.14\times10^{3}$ c	$5.36\times10^{4}\pm 0.71\times10^{4}$ c	$7.45\times10^{3}\pm 1.06\times10^{3}$ c
6 days	$9.91\times10^{5}\pm 1.74\times10^{5}$ d	$5.20\times10^{5}\pm 0.67\times10^{5}$ d	$6.98\times10^{3}\pm 0.80\times10^{3}$ d	$5.50\times10^{3}\pm 0.37\times10^{3}$ d	$1.61\times10^{5}\pm 0.22\times10^{5}$ d	$2.88\times10^{4}\pm 0.46\times10^{4}$ d
8 days	$1.16\times10^{7}\pm 0.21\times10^{7}$ e	$9.49\times10^{6}\pm 1.84\times10^{6}$ e	$1.13\times10^{4}\pm 0.17\times10^{4}$ e	$8.71\times10^{3}\pm 1.26\times10^{3}$ e	$3.07\times10^{6}\pm 0.38\times10^{6}$ e	$7.37\times10^{4}\pm 2.05\times10^{4}$ e
10 days	Spoiled					
12 days						

Means with different superscripts in the same column were significantly differed (P<0.05)

Table 4: Statistical analytical results of microbial counts (cfu/g) in the examined samples of camel meat during chilling storage at 4°C (n=40).

Storage time	camel meat (Mean ± S.E)					
	Total mesophilic count	**Psychrotrophic count**	**Yeast count**	**Mold count**	**Coliform count**	***S. aureus* count**
Zero time	$6.23\times10^{3}\pm 0.84\times10^{3}$ A	$3.96\times10^{3}\pm 0.54\times10^{3}$ A	$1.99\times10^{2}\pm 0.27\times10^{2}$ **A**	$1.50\times10^{2}\pm 0.89\times10^{2}$ **A**	$5.65\times10^{2}\pm 0.89\times10^{2}$ **A**	$2.23\times10^{2}\pm 0.89\times10^{2}$ **A**
2 days	$1.92\times10^{4}\pm 0.30\times10^{4}$ B	$1.20\times10^{4}\pm 0.18\times10^{4}$ B	$6.78\times10^{2}\pm 0.90\times10^{2}$ **B**	$5.12\times10^{2}\pm 0.46\times10^{2}$ **B**	$2.34\times10^{3}\pm 0.29\times10^{3}$ **B**	$6.07\times10^{2}\pm 0.65\times10^{2}$ **B**
4 days	$8.41\times10^{4}\pm 1.29\times10^{4}$ C	$6.70\times10^{4}\pm 0.91\times10^{4}$ C	$1.16\times10^{3}\pm 0.15\times10^{3}$ **C**	$8.72\times10^{2}\pm 1.43\times10^{2}$ **C**	$9.98\times10^{3}\pm 1.82\times10^{3}$ **C**	$1.90\times10^{3}\pm 0.28\times10^{3}$ **C**
6 days	$3.50\times10^{5}\pm 0.42\times10^{5}$ D	$1.8\times10^{5}\pm 0.26\times10^{5}$ D	$4.07\times10^{3}\pm 0.51\times10^{3}$ **D**	$2.35\times10^{3}\pm 0.29\times10^{3}$ **D**	$6.79\times10^{4}\pm 1.01\times10^{4}$ **D**	$5.69\times10^{3}\pm 0.73\times10^{3}$ **D**
8 days	$9.64\times10^{5}\pm 2.03\times10^{5}$ E	$5.33\times10^{5}\pm 0.59\times10^{5}$ **E**	$8.25\times10^{3}\pm 1.42\times10^{3}$ **E**	$4.96\times10^{3}\pm 0.62\times10^{3}$ **E**	$4.89\times10^{5}\pm 0.57\times10^{5}$ **E**	$9.44\times10^{3}\pm 1.81\times10^{3}$ **E**
10 days	$8.97\times10^{6}\pm 1.70\times10^{6}$ F	$4.27\times10^{6}\pm 0.62\times10^{6}$ **F**	$2.34\times10^{4}\pm 0.29\times10^{4}$ **F**	$9.10\times10^{3}\pm 0.60\times10^{3}$ **F**	$1.48\times10^{6}\pm 0.23\times10^{6}$ **F**	$4.74\times10^{4}\pm 0.60\times10^{4}$ **F**
12 days	Spoiled					

Means with different superscripts in the same column were significantly differed (P<0.05)

Table 5: Statistical analytical results of the chemical indices in the examined samples of cattle meat during chilling storage at 4°C (n=40).

Storage time	Cattle meat (Mean ± S.E)						
	PH	**TBA**	**TVN**	**PV**	GSH-Px	CAT	**FFA**
Zero time	5.69 ± 0.02^{a}	0.11 ± 0.01^{a}	3.17 ± 0.18^{a}	0.27 ± 0.02^{a}	19.72 ± 0.86^{a}	7.31 ± 0.62^{a}	0.36 ± 0.02^{a}
2 days	5.81 ± 0.02^{ab}	0.29 ± 0.02^{b}	8.63 ± 0.36^{b}	0.56 ± 0.05^{b}	18.94 ± 0.75^{b}	6.65 ± 0.59^{b}	0.71 ± 0.05^{b}
4 days	5.96 ± 0.02^{b}	0.53 ± 0.04^{c}	12.39 ± 0.45^{c}	0.98 ± 0.06^{c}	18.10 ± 0.72^{c}	5.98 ± 0.54^{c}	1.39 ± 0.06^{c}
6 days	6.14 ± 0.02^{bc}	0.78 ± 0.03^{d}	17.99 ± 0.62^{d}	1.44 ± 0.09^{d}	15.67 ± 0.58^{d}	5.01 ± 0.39^{d}	2.28 ± 0.09^{d}
8 days	6.33 ± 0.02^{c}	1.02 ± 0.07^{e}	24.51 ± 0.69^{e}	2.13 ± 0.11^{e}	13.25 ± 0.39^{e}	4.36 ± 0.31^{e}	3.04 ± 0.11^{e}
10 days	Spoiled						
12 days							

Means with different superscripts in the same column were significantly differed (P<0.05)

pH of chilled meat should not exceed 6 **(EOS, 2013)**
TBA of chilled meat should not exceed 0.90 mg/Kg **(EOS, 2013)**
TVN of chilled meat should not exceed 20 mg/100g **(EOS, 2013)**

Table 6: Statistical analytical results of the chemical indices in the examined samples of camel meat during chilling storage at 4°C (n=40).

Storage time	Camel meat (Mean ± S.E)						
	PH	**TBA**	**TVN**	**PV**	GSH-Px	CAT	**FFA**
Zero time	5.61 ± 0.01A	0.06 ± 0.01^{A}	2.49 ± 0.13^{A}	0.14 ± 0.01^{A}	26.43 ± 1.07^{A}	9.17 ± 0.69^{A}	0.22 ± 0.01^{A}
2 days	5.70 ± 0.01^{AB}	0.19 ± 0.01^{B}	6.76 ± 0.27^{B}	0.37 ± 0.04^{B}	24.71 ± 0.93^{B}	8.29 ± 0.63^{B}	0.51 ± 0.04^{B}
4 days	5.83 ± 0.01^{B}	0.46 ± 0.03^{C}	9.92 ± 0.38^{C}	0.75 ± 0.04^{C}	23.56 ± 0.85^{C}	7.71 ± 0.58^{C}	1.04 ± 0.04^{C}
6 days	5.98 ± 0.01^{BC}	0.61 ± 0.02^{D}	13.67 ± 0.50^{D}	1.03 ± 0.07^{D}	20.94 ± 0.67^{D}	6.89 ± 0.56^{D}	1.76 ± 0.07^{D}
8 days	6.10 ± 0.01^{C}	0.77 ± 0.05^{E}	17.34 ± 0.58^{E}	1.79 ± 0.08^{E}	17.88 ± 0.60^{E}	6.42 ± 0.49^{E}	2.40 ± 0.08^{E}
10 days	6.27 ± 0.01^{F}	0.92 ± 0.05^{F}	21.75 ± 0.64^{F}	2.21 ± 0.13^{F}	15.06 ± 0.48^{F}	5.25 ± 0.44^{F}	3.15 ± 0.13^{F}
12 days	Spoiled						

Means with different superscripts in the same column were significantly differed (P<0.05)
pH of chilled meat should not exceed 6 **(EOS, 2013)**
TBA of chilled meat should not exceed 0.90 mg/Kg **(EOS, 2013)**
TVN of chilled meat should not exceed 20 mg/100g **(EOS, 2013)**

DISCUSSION

Sensory analyses

The results of organoleptic tests are given in Tables 1 and 2 obvious differences have been found in sensory analysis between cattle and camel meat that may be related to shelf life of meat. The Sensorial Quality of Fresh cattle meat was acceptable in 6 Th day and became bad degree (Completely Rancid) in 10 Th day. On the other hand the sensorial quality of fresh camel meat was acceptable until in 8 Th day and became bad degree (Completely Rancid) in 12 Th day. From this study, the results of microbiological and chemical changes influence on sensory quality and spoilage of meat. These results confirms with (Madane *et al.,* 2019), assured that these changes negatively affect the sensory quality, nutritional value, and consumer acceptability, and consequently shorten the shelf life of muscle foods.

Microbiological analyses

The bacteriological status of the examined fresh cattle meat recorded in Table 3 were $1.16\times10^{7}\pm 0.21\times10^{7}$, $9.49\times10^{6}\pm 1.84\times10^{6}$, $1.13\times10^{4}\pm 0.17\times10^{4}$, $8.71\times10^{3}\pm 1.26\times10^{3}$, $3.07\times10^{6}\pm 0.38\times10^{6}$ and $7.37\times10^{4}\pm 2.05\times10^{4}$ CFU/g. at 8 Th day and became completely spoiled at 10 Th day for total mesophilic count, total Psychrotrophic count, yeast count, mold count, coliforms count and *S. aureus* count, respectively. The bacteriological status of the examined fresh camel meat recorded in Table 4 were $8.97\times10^{6}\pm 1.70\times10^{6}$, $4.27\times10^{6}\pm 0.62\times10^{6}$, $2.34\times10^{4}\pm 0.29\times10^{4}$, $9.10\times10^{3}\pm 0.60\times10^{3}$, $1.48\times10^{6}\pm 0.23\times10^{6}$ and $4.74\times10^{4}\pm 0.60\times10^{4}$ CFU/g. at 10 Th day and became completely spoiled at 12 Th day for total mesophilic count, total Psychrotrophic count, yeast count, mold count, coliforms count and *S. aureus* count respectively.

Through these results, it is clear that increasing of the microbial load pointing to its possible role in meat spoilage and food

born- illness. This conclusion comply with a previous study performed by SHARAFATI-CHALESHTORI *et al.* (2014), indicated that the rapid microbial growth of newly refrigerated meat shortened its shelf life, reduced storage time and decreased its quality. Accurately, EOS (2013) stated that the aerobic plate count of fresh and frozen meat must not exceed 10^6 cfu/g. as well as *staphylococcus aureus* must not exceed 10^3 cfu/g (NFSA, 2021). In addition, (FAO, 2007) stated that coliforms count exceeding 10^3/g or cm^2 on fresh meat are not acceptable.

Chemical analyses

The chemical status of the examined fresh cattle meat recorded in Table 5 were 6.33 ± 0.02**,** 1.02 ± 0.07, 24.51 ± 0.69**,** 2.13 ± 0.11, 13.25 ± 0.39 , 4.36 ± 0.31 and 3.04 ± 0.11 at 8 Th day and became completely spoiled at 10 Th day for PH, TBA, TVN, PV, GSH-Px , CAT and FFA, respectively. On the other hand, The chemical status of the examined fresh camel meat recorded in Table 6 were 6.27 ± 0.01**,** 0.92 ± 0.05 , 21.75 ± 0.64**,** 2.21 ± 0.13, 15.06 ± 0.48 **,** 5.25 ± 0.44 and 3.15 ± 0.13 at 10 Th day and became completely spoiled at 12 Th day for PH, TBA, TVN, PV, GSH-Px , CAT and FFA, respectively.

These results comply with Pastsart *et al.* (2012) Decreasing the GSH-Px and CAT activities concomitantly excessed lipid oxidation and decreasing the GSH-Px activity also excessed protein oxidation and the initial formation of metmyoglobin This suggests that GSH-Px and CAT have an important role in retarding oxidation,

In addition, EOS (2013) stated that permissible limit of TVN contents in chilled meat should not exceed 20 mg /100g, TBA of fresh meat must not exceed 0.9 mg/kg and pH of chilled meat should not exceed 6 (EOS, 2013)

These Results consistent with Sonale *et al.* (2014) poined out that TBA number may increase due to lipid oxidation and not specifically due to bacterial action. In addition, Papuc *et al.* (2017) showed that Protein oxidation is also considered as an important oxidative process that can cause changes in meat quality. On the other hand, Gheisari and Eskandari (2011) explained that free fatty acid content is a measure of the extent to which hydrolytic rancidity has occurred**.**

CONCLUSION

Chilling preservation at 4 °C enhanced fresh camel meat shelf life for 8 days and fresh cattle meat shelf life for 6 days without undesirable and detrimental effects on its sensory acceptability. Finally, we recommended that the proper hygienic conditions must be followed after slaughtering, transportation and retail shops handling, as well as storing of chilled raw meat.

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التغيرات فى لحوم الجمال والأبقار أثناء فترة الحفظ بالتبريد

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اجريت هذه الدراسة لتقييم التغيرات التى تحدث للحوم الجمال والأبقار خلال فترة الحفظ بالتبريد عند ٤ درجات مئوية. حيث شملت الدراسة التغيرات الحسية (اللون- الرائحة – الملمس/القوام – المظهر العام) التغيرات الميكروبيولوجية (كالعدد الكلى البكتيرى – العدد الكلى للفطريات – عدد البكتيريا القولونية - عدد بكتيريا المكورات العنقودية الذهبية) والتغيرات الكيميائية وشملت (الأس الهيدروجينى – حامض الثيوباربتيورك - نسبة المركبات النيتروجينية الطيارة – قيمة البيروكسيداز – انزيم الكتاليز – انزيم الجلاتاسيون بيروكسداز – محتوى الأحماض الدهنية والأحماض الأمينية – الأحماض الدهنية الحرة). أظهرت نتائج الدراسة أن تغيرات فساد اللحوم حدثت أولا فى لحوم الأبقار ثم لحوم الجمال ووضح هذا من خلال التقييم الحسى والظاهرى وكذلك التلوث الميكروبيولوجى الذى ظهر بأعداد كبيرة فى لحوم الأبقار عن لحوم الجمال وأكدت النتائج ذلك ايضا من خلال التقييم الكيميائى الذى أظهر صلاحية أطول للحوم الجمال عن لحوم الأبقار. باختصار ، فإن الحفظ المبرد عند ٤ درجات مئوية عزز فترة الصلاحية وأوضح أن صلاحية لحوم الإبل الطازج لمدة ٨ أيام وصلاحية لحوم الأبقار الطازجة لمدة ٦ أيام دون آثار غير مرغوب فيها وضارة على قبولها الحسي.