J. Agric. Sci. Mansoura Univ., 32 (10): 8341 - 8350, 2007

JERKY, A SNACK FOOD FROM BEEF AND BROILER MEAT

Yousef, Nahed S.
Food Science and Technology Dept., Faculty of Home Economics+, Al-Azhar University, Tanta, Egypt.

ABSTRACT

Jerky as ready to eat products was produced from beef top round and broiler breast meat. Beef and broiler meat were dried in either simple metal structure in the sun or in normal kitchen oven. Jerky samples were stored in polyethylene bags for 9 weeks at ambient temperature. Jerky products were evaluated for microbial count, sensory, and chemical properties. Immediately after drying, no pathogenic bacteria were detected. Counts of aerobic bacteria were decreased significantly in both sun and kitchen oven dried beef and broiler jerky. Jerky dried in kitchen oven was better in texture, flavor, taste and chewiness than the other. Beef and broiler fresh meat have initial moisture to protein ratio (MPR) of 3.79 and 3.96, while after sun and kitchen oven drying the MPR was decreased to 0.30 and 0.38. Free fatty acids for both dried beef and broiler jerky exceeded 1.2% after three weeks of storage at ambient temperature. During storage period, the peroxide value was increased in all jerky samples.
Keywords: Beef jerky, broiler jerky, *Salmonella*, faecal coliform.

INTRODUCTION

Meat is a highly nutritive food for human because it is a good source of all essential amino acids and a major source of B-complex vitamins and minerals. Its distinctive flavor makes it one of the most preferrable foods. However, the intrinsic properties of fresh meat including relatively high water activity, slightly acidic pH and availability of carbohydrate and proteins make it a good substrate for microbial growth and consequently it is a highly perishable commodity (Rahman *et al.*, 2005).

The shelf life of meat products is limited by enzymatic and microbiological spoilage. To prolong the shelf life of meat and meat products, traditional preservation methods using sun drying and salting techniques have been used. The main method of meat preservation transferred by the medieval Arabic source to West Africa was that of sun drying. Although modern methods of meat preservation might be preferred by consumers, refrigeration equipment is expensive to install and difficult to maintain in tropical developing countries, so dried meat products often maintain their importance. There are many methods used to prepare sun dried meat in different parts of the world (Lawrie, 1979).

Jerky is a food known since ancient Egypt. Humans made jerky from animal meat that was too big to eat all at once, such as bear, buffalo, or whales. Jerky processing includes slicing or forming the beef or broiler, marinating the strips, heating, and then drying. The purpose of the heating step is to apply a lethality treatment to kill or reduce the numbers of microorganisms so jerky becomes safe for human consumption. Drying jerky stabilizes the final product and prevents the growth of toxigenic microorganisms such as *Staphylococcus aureus* (Calicioglu *et al.*, 2002).

Beef jerky is promoted as a nutritious, low calorie product, which is low in cholesterol and fat and high in protein and energy. A new approach to meat based snack foods might focus on combined ingredient products that would compete effectively with potato chips or corn chips while delivering less fat and carbohydrates and more proteins (Park *et al.*, 1993).
The aim of this study is to evaluate jerky produced from beef and broiler meat to be used as handy food for backpackers and other who don't have access to refrigerators.

MATERIALS AND METHODS

Preparation of meat samples

Beef top round and broiler breast muscles meat samples were obtained from a local market. External fat was completely trimmed from raw beef and broiler meat before partially frozen to make slicing easier. The meat muscle samples were then cut into strips of approximately 4-6 mm in thickness. Meat and broiler sliced samples were separately placed into two bowls. The dry mixture (w/w) of 3% table salt, 0.5% garlic powder, 0.5% black pepper, 0.4% onion powder, 0.2% ginger and 0.1% red pepper, was thoroughly mixed and rubbed into the surface of the sliced meat in order to marinate the jerky. Thereafter, the sliced beef and broiler meat were cured in the refrigerator for 24 h at 4°C prior to drying.

Drying procedure

Meat strips were suspended on the metal skewers hooked at one end in a standard kitchen gas oven heated at 71°C for 15 min as a pre-drying process to eliminate the pathogenic microorganisms (Harrison and Harrison, 1996). The kitchen door was then slightly opened to help removal of the excess moisture. Samples of beef and broiler strips were divided into two sets. The first set of samples was dried in the kitchen oven at 50-55°C and 26-30 % relative humidity. The second set was sun dried in June at recorded temperature and relative humidity of 40-45°C and 45-50%, respectively in an open ventilated area in a simple movable metal construction protected from insects and birds by netting. The beef and broiler samples were dried to final moisture content of 20-25 % (Konieczny *et al.*, 2004). Jerky samples were then, weighed and backed into polyethylene bags. Jerky samples were stored for a period of nine weeks during June and July at room temperature and evaluated at three week intervals. During storage, the temperature ranged between 30 and 45°C while relative humidity ranged between 50 and 65%.

Chemical analysis

Jerky samples were analyzed for moisture content, fat, ash, total crude protein and total nitrogen content as described in the A.O.A.C. (1995). Free fatty acids (FFA) and peroxide values were determined as well (Egan *et al.*, 1987).

The value of the moisture-to-protein ratio (MPR) was calculated using the method recommended by the Food Safety and Inspection Service (FSIS), USA (Food Standards, 2003) to assess shelf life of food products subjected to drying.

Microbiological analysis

Ten grams of jerky samples were aseptically blended into sterile 90 ml saline (0.85% KCl) and mixed well, then serial decimal saline dilutions were made. The tested saline solution was pour-plated onto each of triplicate plates of each tested agar medium. Total aerobes were enumerated on Difco nutrient agar incubated at 30°C for 48 h., yeast and moulds were counted on Rose Bengal agar incubated at 25°C for 5 days.

Faecal *E. coli* was estimated using the most probable number (MPN) according to Woomer (1994). One ml of the tested saline dilution was inoculated in triplicate tubes containing MacConkey broth medium. Tubes showing acid and gas production after incubation for 24 h at 44.4°C were enumerated as described by Porter (1979).

Salmonella was enumerated by the MPN technique. One ml of the tested saline dilution was inoculated in triplicate tubes containing the enrichment selenite cystine broth medium and incubated for 24 hrs at 37°C. Each enrichment broth was subsequently streaked onto xylose lysine decarboxylase (XLD) agar medium and incubated for 24 hrs at 37°C (Porter, 1979).

Sensory analysis

Sensory analysis was carried out on beef and broiler jerky immediately after drying. A trained 10 members panel evaluated the samples using a scale of 1 to 10. The evaluated parameters were tenderness, flavor, taste, color, chewiness and overall palatability (McWilliams, 1997).

Statistical analysis

Statistical analysis was made by statistical program SAS (1994). Duncan multiple range test (Duncan, 1955) was used to separate means.

RESULTS AND DISCUSSION

Drying of Beef and broiler jerky

Kitchen oven and sun drying curves for beef and broiler jerky products are shown in Figure (1). A sharp decrease in moisture content was noticed in all samples after heating at about 70°C for 15 min. The beef and broiler jerky lost 30 and 22 % of their moisture contents, respectively. Drying times needed to reach 20-25 % moisture content for respective jerky products of sun and kitchen oven dried samples were 8 and 4 h.

Sensory evaluation

Sensory evaluation of beef and broiler jerky made immediately after drying are given in Table (1). Significant differences in texture, flavor, taste, color, chewiness and palatability were scored among kitchen oven and sun dried beef and broiler jerky samples. Jerky samples dried in kitchen oven were better in texture, flavor, taste and chewiness than sun dried ones.

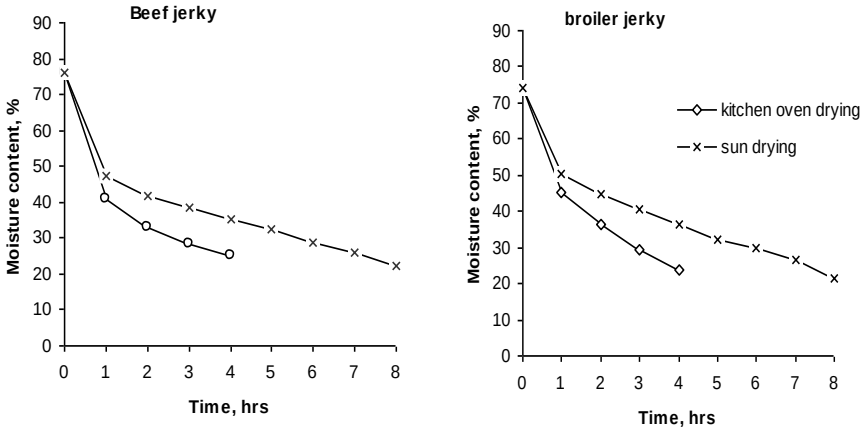

Fig. 1. Kitchen oven and sun drying curves of beef and broiler jerky.

Lee *et al.* (2004) reported that texture, ensuring specific chewiness, is one of the most important sensory attributes of jerky type snack foods, determining the uniqueness and market attractiveness of this type of products. The best color was obtained in kitchen oven dried chicken jerky. Moreover, palatability was inferior in the sun dried beef jerky compared with all dried jerky samples. These observations may be due to the longer period of solar drying which might led to dark browning during drying (Van Oeckel *et al.,* 1999).

Table 1. Sensory evaluation of beef and broiler jerky after drying

Treatment	Parameters					
	Texture	Flavor	Taste	Color	Chewiness	Palatability
Beef jerky						
Sun drying	$5.4^{b} \pm 1.78$	$6.6^{b} \pm 1.65$	$6.6^{b} \pm 1.65$	$6.3^{b} \pm 1.49$	$5.1^{b} \pm 1.85$	$6.1^{b} \pm 1.20$
Kitchen oven drying	$8.0^{a} \pm 1.05$	$8.7^{a} \pm 1.57$	$9.1^{a} \pm 1.29$	$7.2^{b} \pm 1.14$	$8.3^{a} \pm 1.25$	$7.1^{ab} \pm 1.66$
Broiler jerky						
Sun drying	$6.1^{ab} \pm 2.77$	$7.1^{b} \pm 1.85$	$7.4^{ab} \pm 1.43$	$7.5^{b} \pm 2.12$	$5.6^{b} \pm 2.22$	$7.7^{a} \pm 1.77$
Kitchen oven drying	$7.8^{a} \pm 1.55$	$8.0^{ab} \pm 1.49$	$8.4^{a} \pm 1.43$	$9.1^{a} \pm 1.10$	$6.9^{ab} \pm 2.56$	$8.4^{a} \pm 1.65$

a and b means in the same column with different superscripts are significantly different ($P \leq 0.05$)

Evaluation of Microbial quality

Microbial counts of fresh, cured and dried beef and broiler jerky are shown in Tables (2 and 3). The fresh beef and broiler meat had an initial aerobic bacterial counts of 2.3 x 10^4 and 5.8 x 10^5, mold counts of 4.3 x 10^3 and 4.5 x 10^3 and yeast counts of 2.5 x 10^2 and 1.03 x 10^4 cfu per gram, respectively. After curing time, the microbial count increased two logarithmic cycles in aerobic plate count and one logarithmic cycle in yeast count for both beef and broiler cured meat. On the other hand, one logarithmic cycle was decreased in mold count in both meat types.

The initial numbers of *Salmonella* and fecal *E. coli* present were less in beef than broiler meat. MPN estimates were 160 and 400 cells per gram *Salmonella* and 450 and > 14000 cells per gram *E. coli* for fresh beef and broiler meat, respectively. Primary sources of these species are most probably the workers and their equipments in the local market (Rahman *et al.*, 2005). After curing time, decreases of 38.75 and 20.0 % were recorded in *Salmonella* for cured beef and broiler meat, respectively.

Table 2. Effect of sun and kitchen oven drying on microbial counts of beef jerky stored at ambient temperature for 9 weeks

Treatment	Counts, cfu g^{-1}				
	Aerobic bacteria	Mould	Yeast	*Salmonella* spp. *	Fecal *E. coli**
Fresh meat	2.3 x 10^4	4.3 x 10^3	2.5 x 10^2	160	450
Cured meat	2.0 x 10^6	1.4 x 10^2	3.8 x 10^3	98	400
Sun drying					
stored for					
0 week	7.8 x 10^2	1.1 x 10^2	n.d	n.d	n.d
3 weeks	1.3 x 10^4	1.1 x 10^2	n.d	n.d	n.d
6 weeks	7.1 x 10^4	1.3 x 10^2	n.d	n.d	n.d
9 weeks	1.2 x 10^4	1.5 x 10^2	n.d	n.d	n.d
Kitchen oven drying					
stored for					
0 week	3.0 x 10^2	9.5 x 10^2	n.d	n.d	n.d
3 weeks	1.2 x 10^3	2.2 x 10^2	n.d	n.d	n.d
6 weeks	5.0 x 10^3	1.6 x 10^2	n.d	n.d	n.d
9 weeks	8.1 x 10^4	3.4 x 10^3	n.d	n.d	n.d

*** Most probable number**
n.d = not detected

Immediately after drying process and during storage period, *Salmonella*, faecal *E. coli* and yeast were not detected in all jerky samples. The USDA/FSIS (1998) recommended cooking meat to 71.1°C as a pre-drying step to eliminate the risk of pathogen survival. In their studies, Harrison *et al.* (2001) reported that heating prior to drying at 71°C reduced the numbers of all three pathogens (*E. coli* O157: H7, *Lesteria monocytogenes* and *Salmonella*), below the detection limits.

Table 3. Effect of sun and kitchen oven drying on microbial count of broiler jerky stored at ambient temperature for 9 weeks

Treatment	Count, cfu g^{-1}				
	Aerobic bacteria	**Mould**	**Yeast**	***Salmonella* spp.**	**Fecal *E. coli***
Fresh meat	5.8×10^5	4.5×10^3	1.03×10^4	400	Over 140.000
Cured meat	3.4×10^7	1.8×10^2	2.0×10^5	320	140.000
Sun drying					
stored for					
0 week	7.26×10^4	1.4×10^2	n.d	n.d	n.d
3 weeks	1.2×10^5	0.4×10^2	n.d	n.d	n.d
6 weeks	3.9×10^5	2.4×10^2	n.d	n.d	n.d
9 weeks	3.2×10^5	1.1×10^2	n.d	n.d	n.d
Kitchen oven drying					
stored for					
0 week	3.1×10^4	7.5×10^2	n.d	n.d	n.d
3 weeks	7.5×10^4	0.1×10^2	n.d	n.d	n.d
6 weeks	4.9×10^5	4.8×10^3	n.d	n.d	n.d
9 weeks	5.8×10^5	8.4×10^4	n.d	n.d	n.d

*** Most probable number**
n.d = not detected

Immediately after drying, the counts of aerobic bacteria in cured meat were decreased three logarithmic cycles in both sun and kitchen oven dried beef and broiler jerky. After 9 weeks storage, fungi counts increased one and two logarithmic cycles in kitchen oven dried beef and broiler jerky, respectively.

Relative increases of approximately one logarithmic cycle were observed in numbers of aerobic bacteria for sun and kitchen oven dried beef and broiler jerky samples during the nine weeks storage period. Obtaining a microbially safe product depends not only on the parameters of the drying process of the seasoned meat but also on the appropriate selection of components of the used spice blend and functional additives which ensures obtaining proper water activity (aw < 0.85) to limit the microbial growth (HACCP, 1997).

Evaluation of chemical quality

Chemical components of sun and kitchen oven dried beef and broiler jerky stored at ambient temperature for 9 weeks are shown in Tables (4 and 5). The determines of the chemical properties found in this study were similar to those found by Konieczny *et al.* (2004) as these types of foods are classified as intermediate moisture foods (IMF).

Table 4. Effect of sun and kitchen oven drying on chemical components of beef jerky stored at ambient temperature for 9 weeks

Treatment	Moisture, %	Protein, %	MPR*	Ash, %	Fat, %	Peroxide value**	FFA,%
Fresh meat	76.25	20.10	3.79	4.18	1.86	18.53	0.72
Sun drying							
stored for							
0 week	21.11	64.55	0.33	6.45	4.13	27.83	1.21
3 weeks	20.65	64.28	0.32	6.59	3.98	34.73	1.45
6 weeks	19.85	65.15	0.30	6.72	3.20	57.45	2.80
9 weeks	19.24	64.98	0.30	6.88	3.25	69.81	3.05
Kitchen oven drying							
stored for							
0 week	24.20	63.87	0.38	6.15	3.89	22.30	1.05
3 weeks	23.45	62.60	0.37	6.45	3.90	27.36	1.14
6 weeks	21.15	62.85	0.34	6.81	3.69	36.38	2.72
9 weeks	20.80	63.90	0.33	6.98	3.50	50.45	3.62

* MPR moisture to protein ratio
** peroxide value meq kg^{-1}

Table 5. Effect of sun and kitchen oven drying on chemical components of broiler jerky stored at ambient temperature for 9 weeks

Treatment	Moisture, %	Protein, %	MPR*	Ash, %	Fat, %	Peroxide value**	FFA,%
Fresh meat	74.17	18.75	3.96	3.65	1.66	17.22	0.57
Sun drying							
stored for							
0 week	21.68	63.50	0.34	5.45	3.89	25.72	1.00
3 weeks	20.45	63.75	0.32	5.44	3.83	29.68	1.84
6 weeks	19.58	64.18	0.31	5.73	3.70	32.17	2.95
9 weeks	19.87	64.09	0.31	6.03	3.73	45.25	3.73
Kitchen oven drying							
stored for							
0 week	23.81	62.25	0.38	5.63	3.01	22.26	1.55
3 weeks	22.50	63.45	0.35	5.68	3.16	36.26	1.78
6 weeks	21.88	63.78	0.34	5.73	3.15	40.80	3.80
9 weeks	20.45	63.75	0.32	5.90	3.20	53.65	3.85

*** MPR moisture to protein ratio**
**** peroxide value meq kg^{-1}**

From tables 4 and 5, it can be seen that beef and broiler meat have initial MPR of 3.79 and 3.96, respectively, which is slightly less than the accepted recommended values (4.5). After sun and kitchen oven drying, the MPR ranged between 0.30 and 0.38 in all jerky samples. According to the recommendations of the American Food Safety and Inspection Service (FSIS), microbially safe jerky type products are those with the MPR not exceeding 0.75 (Food standards, 2003). It can be seen that water content in jerky products is decisive both for their texture and shelf life (Konieczny *et al.*, 2004).

Data in Tables (4 and 5) also illustrate fat content in fresh beef and broiler meat to be 1.86 and 1.66%, respectively. Fat content in sun and

kitchen oven dried beef jerky stored for only 3 weeks was found to be 4.13 and 3.89%, respectively. Also, sun and kitchen oven dried broiler stored for 3 weeks contained 3.89 and 3.01% fat, respectively.

Fat is important in flavor development of meat, as meat ages the fat deteriorates through microbial attack and tissue enzyme activity which causes the development of free acidity and oxidation of unsaturated bonds. This results in the development of bad odors and deterioration of taste (Pearson, 1968). The same author reported that unpleasant flavors in cooked beef were first noticeable at a level of 2-3% FFA (as oleic acid) in extracted fat.

Peroxide value is among the chemical criteria to follow the extent of oxidative lipid deterioration and rancidity (Jacobson, 1961). Data in Tables (4 and 5) show that sun dried beef and broiler jerky gave higher peroxide values than those of kitchen oven dried beef and broiler jerky immediately after drying. During storage period, the increase of peroxide value was noticed in all jerky samples. After storage for 9 weeks, peroxide value reached 69.81 and 45.25 meq kg^{-1} fat in sun dried beef and broiler jerky, respectively. At the same storage period, peroxide value was 50.45 and 53.65 meq kg^{-1} fat in kitchen oven dried beef and broiler jerky, respectively. It has been reported (Rahman *et al.*, 2002) that this is due to the fact of increased oxygen diffusion and exposed surface area during storage period. It has been mentioned that, Jerky could be protected against oxidative deterioration during storage by natural antioxidants as rosemary extract at a sensory acceptable level of 1000 ppm, incorporated prior to drying (Nissen *et al.*, 2000).

Finally, it could be concluded that home made jerky is a safe microbially product when stored for a period of 9 weeks at summer ambient temperature. However, only 3 weeks is a safe storage period from the chemical deterioration point of view. Though, natural antioxidants might be added during curing and prior to drying to prevent fat oxidation and consequently elongate the shelf life of the product.

REFERENCES

A.O.A.C. (1995) Official Methods of Analysis, 16th Ed. Association of Official Analytical Chemistry. ed. Wilson Boulevard Arlington, Virgenia, 22201, U.S.A.

Calicioglu, M.; J.N. Sofos; J. Samelis; P.A. Kendall and G. C. Smith. (2002) Destruction of acid-adapted and non-adapted *Salmonella* during drying and storage of beef jerky treated with marinade. Animal Sciences Research Report. Colorado State University.

Duncan, D. (1955) Multiple rang and multiple F test. Biometric., 11: 1-42. Edition ASSOC, Office. Anal. Chem., Arlington.

Egan, H.; R.S. Kirk and R. Sawyer (1987) In: Pearson's Chemical Analysis of Foods, 8th ed. Longman Scientific and Technical. Essex, England.

Food Standards and Labeling Policy Book (2003) Food Service and Inspection Service, Ed., USDA.

HACCP Generic Model-Dried Meats (Beef Jerky) (1997) CFIA, ACIA Report, October 1997, Canada, pp. 1-35.

Harrison, J.A. and M.A. Harrison (1996) Fate of *Escherichia coli* O157:H7, *Listeria monocytogenes*, and *Salomnella typhimurium* during preparation and storage of beef jerky. J. Food Prot., 59 (12): 1336-1338.

Harrison, J.A.; M.A. Harrison; R.A. Rose and R.A. Shewfelt (2001) Home-style beef jerky: effect of four preparation methods on consumer acceptability and pathogen inactivation. J. Food Prot., 64: 1194-1198.

Jacobson, G.A. (1961) Some aspects of chemical assessment of fat and oil flavors. Proc. Flavor Chemistry Symposium, pp. 165-178, Campbell soup Co., Camden, U.S.A.

Konieczny, P.; J. Stangierski and J. Kijowski (2004) Physical and chemical characteristics and acceptability of home style beef jerky. Meat Science, 76: 253-257.

Lawrie, R.A. (1979) "Meat Science". 3rd ed. Pergamon Press, Oxford.

Lee, J. H.; E. Chambers; D.H. Chambers; K.B. Chin; R.Y. Kim and S.S. Chun. (2004) Descriptive sensory characteristics of beef jerky prepared different method. In Proceeding of IFT Annual Meeting, July 12-16, Las Vegas, USA, Poster 83G-30.

McWilliams, M. (1997) Sensory Evaluation. In: Foods Experimental Perspectives. 3rd ed. Merrillan Imprint of Prentice Hall, Upper Saddle Rever, New Jersy. pp. 33-67.

Nissen, L.R.; L. Mansson; G. Bertelsen; T. Huynh-Ba and L. H. Skibsted (2000) Protection of dehydrated chicken meat by natural antioxidants as evaluated by electron spin resonance spectrometry. J. Agric. Food Chem., 48 (11): 5548-5556.

Park, J.; K.S. Rhee; B.K. Kim and K.C. Rhee (1993) High-protein texturezed products of defatted soy flour, corn starch and beef: shelf-life, physical and sensory properties. J. Food Sci., 58:21-27.

Pearson, D. (1968) Application of chemical methods for the assessment of beef quality. Part II- Methods related to fat spoilage. J. Sci. Food Agric., 19: 553-556.

Porter, W.M. (1979) The "most probable number" method for enumerating infective propagules of vescular mycorrhizal fungi in soils. Aust. J. Soil Res., 17: 515-519.

Rahman, M.S.; O.S. Al-Amri and I. Al-Bulushi (2002) Pores and physico-chemical characteristics of dried tuna produced by different methods of drying. J. Food Engin., 53: 301-313.

Rahman, M.S.; Z. Salman; I.T. Kadim; A. Mothershaw; M.H. Al-Riziqi; N. Guizani; O. Mahgoub and A. Ali (2005) Microbial and physico-chemical characteristics of dried meat processed by different methods. Int. J. Food Engin., 1 (2): Articl 3, 1-14.

SAS Institute (1994) SAS USERS guid. SAS. Inst. Inc. Cary. NC.

United States Department of Agriculture- Food Safety and Inspection Service. (USDA/FSIS) (1998) Consumer education and information: http://www.fsis.usda.gov/OA/pubs/jerky/html

Van Oeckel, M.J.; U. Warnants and V. Boucque (1999) Measurement and prediction of pork color. Meat Sci., 52: 347-354.
Woomer, P.L. (1994) Most Probable Number Counts. SSSA Book Series. 5: 59-79.

وجبة خفيفة من اللحم المجفف (الجركى)المصنع من اللحم البقرى ودواجن التسمين

ناهـد ســـامى يوســـف
قسم علوم وتكنولوجيا الأغذية - كلية الاقتصاد المنزلى - جامعة الأزهر – طنطا – مصر

الجركى والذى يعتبر من الوجبات الخفيفة الجاهزة للأكل مباشرة تم تصنيعه من اللحم البقرى وصدور الدواجن على درجة حرارة الغرفة. ولقد تم تجفيف اللحم البقرى والدواجن تجفيف شمسى وكذلك عن طريق فرن المطبخ المنزلى. هذا وقد خزنت عينات الجركى فى أكياس من البولى اثيلين لمدة ٩ أسابيع تحت ظروف الجو العادية. وتم تقييم الجركى المصنع من الناحية الميكروبية والحسية والكيميائية. ولقد أظهرت النتائج أن الجركى الناتج لم يحتوى على بكتريا مرضية مثل السالمونيلا وبكتريا القولون نتيجة للمعاملة الحرارية التى استخدمت فى التصنيع. وأيضاً قلت أعداد البكتريا الهوائية ثلاث دورات لوغاريتمية فى كل من الجركى المصنع من اللحم البقرى والدواجن والمجفف فى فرن المطبخ. وقد أثبت التقييم الحسى أن عينات الجركى المجفف فى الفرن المنزلى أفضل من تلك المجففة شمسياً من ناحية النكهة والطعم والقابلية للمضغ. ولقد كانت نسبة الرطوبة إلى البروتين فى اللحم البقرى ولحم الدواجن الطازج ٣,٧٩ و ٣,٩٦ على التوالى أما بعد التجفيف فقلت هذه النسبة إلى أن وصلت ٠,٣٠ و ٠,٣٨ على التوالى. كما زادت الأحماض الدهنية الحرة فى جميع عينات الجركى عن ١,٢ % بعد ثلاث أسابيع من التخزين وزاد أيضاً رقم البيروكسيد لجميع عينات الجركى أثناء التخزين.