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Proceeding Paper

Dried Camel (*Camelus dromedarius*) Meat Contributing to Food Safety †

Youcef Rahmani [1,2,3,*] and Réda Khama [2,4]

1 Department of Process Engineering, University of Ouargla, Ouargla 30000, Algeria
2 Laboratory of Process Engineering, Faculty of Applied Sciences, University of Ouargla, Ouargla 30000, Algeria; r.khama@univ-batna2.dz
3 Scientific and Technical Research Centre in Physico-Chemical Analysis, Bousmail 42004, Algeria
4 Department of Process Engineering, Faculty of Technology, University of Batna 2, Batna 05000, Algeria
* Correspondence: rahmani.youcef@univ-ouargla.dz
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Abstract: The effect of static drying on the physicochemical quality of camel (*Camelus dromedarius*) meat slices as driedin an oven at 65 °C, with the aim of contributing to food safety. During the experiments, meat was cutinto. 8 ± 0.2 cm thick slices, soaked in a saline solution for 30 min, and then dried. Moisture content wasmeasured during the drying phase, and physicochemical parameters, such as protein, ash, sodium, pH, and mineral content, such as calcium (Ca), phosphor (P), magnesium (Mg), potassium (K), zinc (Zn), iron (Fe), copper (Cu) and manganese (Mn), were monitored before and after drying. The colorimetric parametersof the dried samples are also measured. The results show that the physicochemical quality of the dried camelmeat meets the requirements of the Codex Alimentarius Commission. Indeed, the moisture content decreased from 73.94 ± 0.51% to 13.33 ± 0.44%, and the dried food samples were characterized by increases (i) from 19.72 ± 0.30% to 50.97 ± 0.65% in protein content; (ii) from 1.115 ± 0.012% to 4.781 ± 0.047%, in ash content; (iii) from 260 ± 11.7 mg to 1690 ± 32 mg, in the sodium content (for 100 g of dry matter), and (iv) from 5.956 ± 0.087 to 6.203 ± 0.091 in pH value. However, the variation is not significant for all mineral content parameters. Finally, themean values of the colorimetric parameters of brightness (L*), redness (a*), and yellowness (b*) are 37.13 ± 1.64, 22.02 ± 0.72, and 7.73 ± 0.69, respectively (before drying) and they are 25.57 ± 1.56, 9.43 ± 0.78, and 3.74 ± 0.21, respectively (after drying).

Keywords: *Camelus dromedarius*; camel meat; drying; quality; safety food

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1. Introduction

The dromedary (*Camelus dromedarius*) is a species of domestic mammal of the family Camelidae and genus Camelus [1]. The exploitation of the productive potential of the livestock sector is based on several sectors, the main ones being meat, milk, and its derivatives [2]. The consumption of camel meat is one of the main resources for the population of arid areas, despite itscontribution to the world's production of red meat being very marginal. Several traditional processing methods and preservation are applied for red meat, salted undried, smoked, dried unfermented, fermented semi-dried or dried, cooked, or preservedin fat.

In order to keep the final quality of the processed product [3], several physicochemical parameters are checked during the drying process in order to have a product that meets the national and international requirements of dried meat quality that can be preserved for several months and would beappreciated by caravanners and nomads during their travels. Moreover, dried camel meat is still sold in various preparations, such as sausages, in supermarkets [4,5]. The increase in camel consumption and production has highlighted the role of camel meat in the diet of the population in arid regions [6]. Dried camel

meat is a primary foodsource in arid regions, which is also part of the traditionsofthe population.Indeed, some authors and investigators in the field of consumption estimate that a carcass of an adult dromedary is likely to provide 40 kg of bones, 16 kg of meat, and 10 kg of fat, which can meet an adult man's energy needs for up to 5 days and up to 35 days of protein requirements. From a nutritional point of view, camel meat contains between 20% and 23% protein.

The aim of this experimental investigation is to prove that the drying process of camel meat does not affect its physicochemical quality. On the contrary, drying is a good method forincreasing the shelf life of foods, and it could contribute to food security.

2. Materials and Methods

To carry out this work, we proceeded to a sampling themeat of young camels (less than 4 years old) coming from the regional slaughterhouse of Ouargla City, Algeria. It was thinly sliced (0.8 ± 0.2 cm thickness; 10 ± 0.2 cm length), soaked for 30 min in a cold saline solution of 19% salinity, then dried at 65 °C in an oven. The physicochemical analysis is carried out according to the ISO standards relating to the meat analysis, before and after drying, with both fresh and dried samples.

3. Results and Discussion

The application of the methods of physicochemical analysis relating to meat and meat products on fresh and dried camel meat after salting gives the results summarized in Tables 1 and 2. The increase in dry matter is due to the drying effect caused by loss of water content [7], and the change in color, particularly the parameters a* and b*, reflect the oxidation of myoglobin and make the meat darker. Finally, the increase in sodium content is due to salting.

Table 1. Physicochemical quality of the fresh and dried camel meat.

Composition	Fresh Camel Meat	Camel Meat Dried at 65 °C
Moisture content %	73.94 ± 0.51	13.33 ± 0.44
Dry matter %	26.06 ± 0.47	86.67 ± 0.34
Ash %	1.115 ± 0.012	4.781 ± 0.047
Protein %	19.72 ± 0.30	50.97 ± 0.65
Lipid %	3.744 ± 0.14	3.19 ± 0.29
Sel %	-	3.63 ± 0.21
pH	5.956 ± 0.087	6.203 ± 0.091
Color L*, a*, b*	37.13 ± 1.64, 22.02 ± 0.72, 7.73 ± 0.69	25.57 ± 1.56, 9.43 ± 0.78, 3.74 ± 0.21

Table 2. Minerals and nutritional composition of the fresh and dried camel meat.

Composition (mg/100 g dm)	Fresh Camel Meat	Camel Meat Dried at 65 °C	Composition (ug/100 g dm)	Fresh Camel Meat	Camel Meat Dried at 65 °C
Ca	58.3 ± 6.4	56.2 ± 3.7	Zn	12,830 ± 649	11,983 ± 560
P	675.7 ± 23.6	670.5 ± 13.9	Fe	6647 ± 944	6821 ± 560
Mg	917 ± 83	903 ± 58	Cu	1025 ± 30	1043 ± 22
Na	260 ± 11.7	1690 ± 13	Mn	460 ± 230	390 ± 190
K	70 ± 8.7	64 ± 7.4	-	-	-

4. Conclusions

The production and consumption of camel meat can contribute to food security, in particular, as a source of protein in arid regions and for caravans and nomads. The drying

process could be an additionalmethod for processing and preserving cameline meat, and the nutritional value and physicochemical quality of the dried meat meet the required standards of the food code.

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