Small Ruminant Research 128 (2015) 41–49

Contents lists available at ScienceDirect

Small Ruminant Research

journal homepage: www.elsevier.com/locate/smallrumres

The comparison of carcass characteristics and chemical composition of dromedary and crossbred (*C. dromedarius* and *C. bactrianus*) camel meat during two growth periods

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ARTICLE INFO

Article history:
Received 15 July 2014
Received in revised form 24 February 2015
Accepted 10 March 2015
Available online 18 March 2015

Keywords:
Camel meat
Chemical composition
Growing
One-humped
Crossbred

ABSTRACT

In this study twenty-four male and female one-humped (6 males and 6 females) and crossbred (*C. dromedarius* × *C. bactrianus*) (6 males and 6 females) camels were grown for six and nine months by completely randomized design. Camels were slaughtered and percentages of meat, total fat and bone of six cuts of carcasses (leg, shoulder, breast, loin, flank and neck) were determined. The dry matter, protein, fat, mineral content (Ca, K, Mg, P, Na, Zn and Fe), ash, non-protein nitrogenous (NPN), and gross energy from six cuts were measured. Results indicated that carcasses from the crossbred group had significantly ($P < 0.05$) higher muscle content (57.6 ± 1.53) than *Dromedary* camels (56.7 ± 1.52). The ratio of meat to bone (M/B) in leg cut of crossbred and one-humped camel meats was 3.1 and 3.0 respectively. The carcass fat content of the crossbred group was significantly ($P \leq 0.05$) lower (13.2% DM) than for *Dromedary* camel group (14.2% DM). The proximate composition of muscle samples from six regions revealed that the moisture percentage of dromedary camels was lower than crossbred camels. The protein percentage in various cuts from crossbred group carcasses was significantly ($P \leq 0.05$) higher than those from *Dromedary* camels. The NPN percentage of female camel meat was higher than male camel samples and was significantly different ($P \leq 0.05$) in leg and neck cuts. Although, there was no difference in meat energy content between the two breed groups, meat samples from camels grew for 9 months had significantly ($P < 0.001$) higher energy content than those fattened for 6 months. Mineral contents of meat were significantly ($P < 0.05$) affected by growth periods. Results of this study indicated that carcass characteristics improved and nutritional value increased during growth periods of crossbreed camels.

1. Introduction

Camel meat is an important source of high quality protein for people living in dry and semi-dry regions. There are two species of camel within the genus *Camelus*. The *Dromedary* one-humped camel (*Camelus dromedaries*) is most widely distributed in the hot arid areas of the Middle East and Africa, whereas the *Bactrian* two-humped camel (*Camelus bacterianus*) is found in parts of central Asia and China (Dorman, 1986). The potential of camel as a meat producer has been studied by Babiker and Yousif (1990); Yaqoob and Nawaz (2007); Kadim et al. (2006, 2008); Hoffman (2008) and Faye and Bonnet (2012). Recently the world consumption of camel meat is increasing and the main "camel meat eaters" with more than 2 kg/habitant/year are in Somalia, Mauritania, Western Sahara, Oman, Emirates and Mongolia (Faye and Bonnet, 2012). FAO (2014) reported that the annual world camel meat production is approximately 525,000 tons. Many

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http://dx.doi.org/10.1016/j.smallrumres.2015.03.005
0921-4488/

researchers suggested that camel meat is healthy and nutritious due to its low fat content, relatively high polyunsaturated fatty acid content and it is considered as a good source of minerals (Kadim et al., 2006, 2008; Shariatmadari, 2003; Babiker and Yousif, 1990; Kurtu, 2004; Yousif and Babiker, 1989). Faye and Bonnet (2012) indicated that the camel meat represents 0.13% of the total meat consumed in the world and 0.45% of the herbivorous meat only; however the growth of camel meat production was multiplied by 2.90 between 1961 and 2009 passing from 123,000 tons to 356,000 tons.

Growth in body weight is the basis of meat production in domestic animals. There are many factors that influence growth rate including breed, nutrition, sex and health (Kadim et al., 2008). Breeding and cross breeding can increase the performance of camel meat production. Lensch (1999) reported the crossbred offspring showed heterosis with respect to body size, hardiness, endurance, longevity and milk yield. Limited studies have been published on the breeding and crossbreeding of the camels.

The *Bactrian* camel is one of the indigenous camel breeds of Iran distributed throughout the North-West of the country. Today there are only about 200 *Bactrian* camels in Ardabil Province and due to its small population; this breed is enlisted as an endangered species (Ansari-Renani et al., 2010). Recently, a scheme of camels' crossbreeding has been performed while using the males of Bactrian and the females of Dromedary (Ebadi et al., 2010; Asadzadeh, 2008; Sarhaddi, 2009 and Salehi et al., 2013). The performance (growth rate, feed conversion ratio, carcass traits) of native dromedary and crosses of *Dromedary* and *Bactrian* camels had been studied by Asadzadeh (2008). He concluded that crosses of female *Dromedary* with the male of *Bactrian* camel had a better performance compared to *Dromedary*.The effect of three fattening periods (6, 9 and 12 months) on performance of crossbred camel showed that there were no significant differences between the 3 groups (Sarhaddi, 2009). However, feed conversion ratio and slaughter weight were significantly affected by the fattening periods.

The objective of this study was to determine the carcass and cuts components (muscle, fat and bone), proximate compositions (dry matter, protein, fat, ash and minerals) and energy content of the meat samples of *Dromedary* and crosses of *Bactrian* and *Dromedary* camels (Fig. 1).

2. Materials and methods

2.1. Sampling procedure

In this study twenty-four male and female one-humped (6 males and 6 females) and crossbred (*C. dromedarius* × *C. bactrianus*) (6 males and 6 females) camels of 12 months of age were used. The F1crossbred camel was the offspring of male *Bactrian* and female *Dromedary*. The weight of yearling male and female crossbred and one-humped camels was 230 ± 26.6, 206 ± 33.8 and 211 ± 23.7, 194 ± 9.3 kg respectively. Animals were grown in the same environmental conditions for six- and nine-month periods at the research farm in the Animal Science Research Institute of Iran (Karaj, Iran). The diet of all camels was fed ad libitum containing; 25% alfalfa, 25% wheat straws

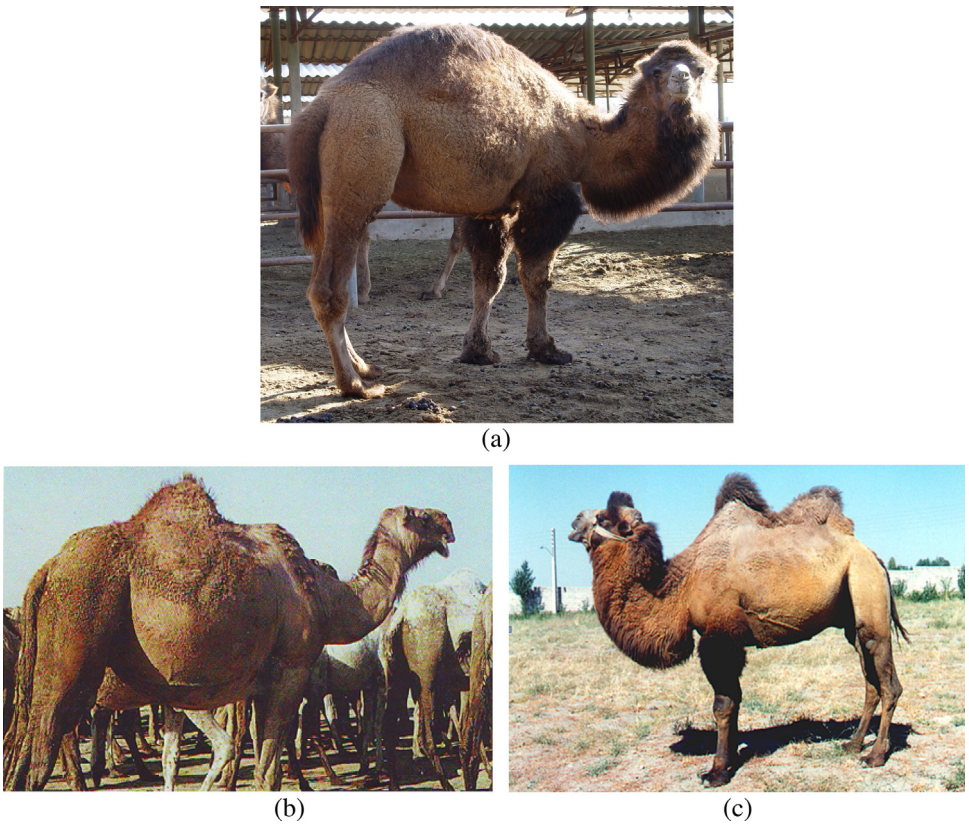

Fig. 1. Crossbred (*C.dromedarius* and *C.bactrianus*) (a). Dromedarius (b) and Bactrianus (c) Iranian camels