

The production potential and importance of camels, camelids in the world

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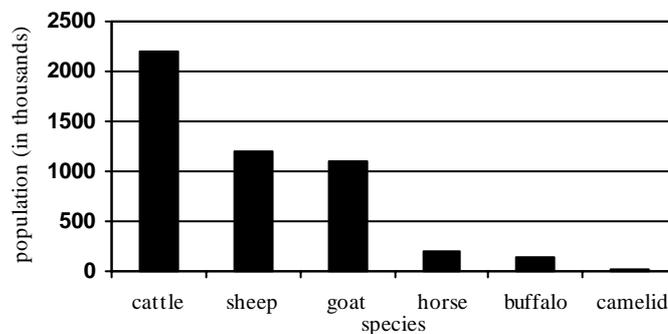
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Introduction: For most of the people, camelids are not linked to zootechnical productions. Yet, large and small camelids play an important role in arid lands or high mountains for milk, meat, wool and energy production. The potential of camelids is generally underestimated for two main reasons: (1) the milk and meat production is yet mainly intended for subsistence farming, or, in case of surplus considered as a gift, (2) only few references are available, even if recording data are now more reliable than in the past. For example: a recent exhaustive study on camel milk gross composition (Konuspayeva, 2007) included 82 available references only. Elsewhere, as the camelids are living most of the time in remote areas (desert or high mountains), their accessibility could be difficult. So, performances' controls are scarce or not reliable or limited to very few animals. However, according to some convenient surveys, camelids are essential for animal protein supply of human in these margin areas, contribute to the maintenance of rural activities and economical development, and finally facilitate the integration in the global economy.

The place of the camelids in the animal production: the world camelid population (21 millions large camelids and 8 millions small ones, probably underestimated) is not important compared to other herbivorous species (fig. 1). However, they represent 12% domestic herbivorous biomass in African arid countries and 2% in Asia.

Fig.1: World herbivorous population



Milk: 85% of the milk produced and marketed throughout the world is cow milk. The camel milk production occupies a tiny place (<1%), far behind the buffalo or even the goat and ewe. According to FAO statistics, the camel milk production was around 1,300,000 tons in 2006 that is quite low and probably underestimated. A different statement can be formulated starting from the extrapolation of the yield awaited for a lactating female. According to the proportion of lactating females of 18% (Hjort af Ornäs, 1988), and an average production of 1500 litres per year, the world production can be estimated to 5,7 million tons of which approximately 55% are taken by the calf (Faye, 2004). The individual dairy production is not well documented in the literature data. A range of 1000 to 3300 litres/lactation is reported in different papers from Africa. In Asia, a wider range is reported from 650 to 6000 litres, even more (Khan and Iqbal, 2001). Finally, the dairy potential of camel appeared higher than that of the cow reared under the same climatic and feeding conditions. In Ethiopia, the Afar farmers rearing simultaneously cattle and camel, get on average 1 to 1.5 litres of milk with afar zebu against 4 to 5 liters with Dankali camel (Richard and Gerard, 1985). According to observations' of Schwartz and Dioli (1992) in the Horn of Africa, reported to the live weight of the animal, the dairy productivity of camel (250 kg/TLU/year) is higher than that of the small ruminants (220 kg) and than that of the zebu cattle (100 kg). Genetic variability is reported (Ismail et Al-Mutairi, 1998), but the selection pressure is generally low.

Meat: The camel meat production represents about 0.7% of the world meat production, i.e. 216,315 tons (FAO, 2006), but informations are quite difficult to collect as the main part of the camel meat data comes from the informal market. Traditionally, camel meat consumption is not common in a subsistence system, the size of the carcass needing to share the meat between a wide numbers of people. However, the urbanization has increased the camel meat demand in most of the arid countries. The exploitation rate concerns on average less than 1% of the animals (class 0-2 years), 2.6% (class 2-3 y), 4.7% (class 3-4 y), 13.2% (class 4-5 y) and 15.4% beyond 5 years (Hjort Af Ornäs, 1988) but with a wide geographical variability according to feeding practices and priority given to the milk production. In this case, the sacrifice of the young males could be more important in order to recover the milk normally intended for the calf. In the Horn of Africa, where camel fattening is traditional, the dressing rate can reach 59 % and the carcass weight, up to 300 kg. Live weight up to 1300 kg has been reported in

Arvana breed in Turkmenistan. In South America, lama and Alpaca meat is considered mainly as a by-product of the wool production which is more well-paid by the international market. In Peru, 8000 tons/y of alpaca meat are available, mainly consumed locally. Camels have a low growth rate, late puberty, long gestation time, so, the meat productivity is lower than for other ruminants: 7.5 kg/TLU/year vs 14 kg for cattle and 35 kg for small ruminants. In traditional conditions, the Daily Growth Rate (DGR in g/day) for one-year camel is 190 to 310g (Faye et al., 1992). In more intensive conditions, it can reach 440-580g. In Australia, a maximum of 1100g was reported.

Power: The camel is used for packsaddle, draught and race. As a pack animal, it is able to walk at 4-5 km/h for 10 hours with 150 to 300 kg on the back. Extreme values with 400-500 kg are reported in Pakistan. In Niger, the weight of the packsaddle is between 200 and 250 kg. The pack camel could transport this charge for 30 to 35 days, walking 60 km each day (Pacholek et al., 2000). The camel is commonly assigned to agricultural works (ploughing, carting, and sowing). Its performances are similar to horse (Schwartz and Dioli, 1992). The racing camel can run 50 to 100 km per day at the speed of 10-12 km/h. In short race (10 km), the best runners can reach 34 km/h with a maximum of 40 km/h.

Other products: Camelids are appreciated for the high quality of their wool (alpaca and Bactrian camel). Recently, the camel leather industry was better valorized in relationship with the touristic activities (especially in Tunisia).

The news trends in camelid production. Three main trends are observed in the camelid world: (i) **intensification of the camel production** with the development of modern dairy farms with high dairy potential lactating camels (as the Al-Majahim breed from Saudi Arabia) and industrial milk processing (pasteurized milk, cheese making, modern packaging), or camel feed-lot with intensification of the reproduction process; (ii) **diversification of the camel production** with increasing of a wider using of camelids in agriculture activities, carting, leisure (mainly for small camelids), increasing demand of camel milk and meat for dietetic and medicinal purposes, (iii) **increasing of the distribution area** in the world linked to the climatic changes (Faye et al., 2008), to the diversification of their use, to the aridification of many parts of the world, to the increasing of the camel products demand in urban areas.

Conclusion: The scientific community plays an essential role for considering camel under three aspects underlying the importance of camelids, now and in the future. The

camelids are interesting as a biological model, as a productive animal for food supply in remote areas, and as an element of the arid ecosystem where they contribute to the desertification combat and food security. The camel scientists have to convince the funding agencies for the high interest of the camelids for the promotion of desert productivity and preservation. However, some lack in camel researches can be considered (reproduction, genetic, milk and meat processing, emerging diseases, and farming economy). The creation of ISOCARD (International Society of Camelid Research and development) is a quite important step to stimulate coordination research between the different camel sciences network through the world.

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