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The role of camels in food security in the arid zone: meat and milk production potential

B. Faye

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The estimated camel population in the world (35 million heads) is low compared to the other domestic farm animals but represents a significant part of the domestic herbivorous biomass in arid countries. As multipurpose animal, the large camelids (dromedary and Bactrian camels) are not only used for packing, pulling or riding, but also for dairy, meat and wool production. Although their estimated milk production (2.85 million tons) and meat production (630,000 tons) worldwide is 0.35 and 0.75% of the total milk and red meat respectively consumed in the world, their contribution could reach more than 10% in Africa. Characterized by hypo-allergic properties, exceptional richness in vitamin C and D, potential health benefit for diabetic patients and lactose-intolerants, effect against diseases affecting liver, dietetic interest (richness in iron, in long-chain fatty acids and essential amino-acids), camel milk is also contributing to the health welfare of people living in remote areas. Camel meat is appreciated for its dietetic virtues low-fat and cholesterol, high essential amino-acid index, beneficial effect on hypertension). Contrary to cow milk and meat produced in almost all the ecosystems of the earth, camel products are produced in desert areas only, from Mauritania to Mongolia, contributing to the pastoralist's diet. Even in rich Gulf countries, more than 70% of the camel milk, the 'white gold of the desert', is self-consumed by the Bedouins providing animal proteins in places where the access to other proteins is difficult. In pastoralist households, camel milk can reach 70% of the dietary calories. Moreover, camel meat is involved in a regional market with important live camel export from Sahelian countries to North-Africa and Arabian Peninsula. Thus, camel milk and meat are contributing to the food security in many remote areas of the old-world, sometimes as exclusive source of animal proteins. In addition, the remarkable increase of urban demand in camel products occurred both in southern and western countries. Indeed, climatic changes, globalization of economy and interest for health benefit of camel products contribute to boost camel rearing in the world and to its spatial expansion.

Phenotypic and genotypic evaluation of camelids, why these species lag behind other livestockP.A. Burger¹ and E. Ciani²

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Increasing desertification and constant human population growth pose a challenge on the field of animal science and production. Old World camels, the one-humped dromedary and two-humped Bactrian camel, seem to be a perfect answer to the demand for sustainable food production in arid environments. As the last livestock species to be domesticated, camels also rank last on the list of available genomic resources. While there are genome assemblies on chromosome-level for *Camelus dromedarius* and on scaffold-level for *Camelus bactrianus* and *Camelus ferus*, tools are still missing for large-scale genomic studies. International cooperations (e.g. International Camel Consortium for Genomic Improvement and Conservation; ICC-GIC) aim to develop necessary high-quality and high-density genomic tools to investigate genotypes underlying traits of interest. With the recently awarded 2019 Illumina® Agricultural Greater Good Initiative grant, this goal is getting within reach. The collection of economical and physiological important phenotypes is currently confined to local farms or regional associations; except from a number of large camel farms (e.g. UAE, CH, KZ) where regular performance recording is practiced on different quantitative and qualitative levels. The lack of governmental support to build infrastructure for animal identification and recording under national breeders' associations hampers the development of a successful camel production sector. There is an urgent need for international promotion and cooperation, like the ARIMnet2 project CARAVAN (Toward a CAmel tRANSnational VAValue chain) linking scientists and breeders in Mediterranean countries. A recent ICAR initiative aims to establish the *status quo* of animal identification and performance recording practices in Old World camels on an international scale. Using the results of this baseline survey, we will identify the immediate next steps to start closing the gap between camels and other livestock in terms of phenotypic and genotypic evaluation.