

## Article

# Machine Milkability of Dromedary Camels: Correlation between Udder Morphology and Milk Flow Traits

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**Simple Summary:** The relation among udder and teat characteristics and milkability traits in dairy animals is well investigated in dairy ruminants but very little knowledge is available on camels. In this experiment, milk flow curves were recorded along with udder and teats' measurements for 32 dairy camels. This study revealed that machine milked camels had well developed teats and udders with large variability in size and shape. Daily milk yield, peak and average milk flow rates were highly and positively correlated with teat diameter and udder depth. However, selection scheme based on dairy potential only could lead to aversive udder drive and significant degradation of the external morphology of the udder. Thus, our study gave first elements for morphological selection based on machine milking characteristics.

**Abstract:** This study aims to measure mammary morphological traits with a functional influence on machine milking ability of Tunisian Camels (*Camelus dromedarius*) and their evolution according to the stage of lactation and parity. Udder and teat measurements were recorded before morning milking and associated with the measurement of milk emission kinetics parameters evaluated with Lactocorder<sup>®</sup> devices (WMB AG, Balgache, Switzerland) and observations. Three main teat shapes were recorded and their dimensions evolved with parity and stage of lactation. The milk flow curves were classified into three main types according to their maximum and average flow rates and they also evolve according to parity and stage of lactation. An average of 41% of the milk flow curves was bimodal. The correlations showed that some morphological traits were unfavorable to rapid milking and that these increase with parity. Therefore, this study provides the first elements for a morphological selection associated with an aptitude for mechanical milking which appears rather good in our dromedaries. Nevertheless, it will be necessary to monitor a possible negative evolution of the functional and anatomical traits of the udders during the career of the animals.

**Keywords:** udder and teat morphology; milk flow; milking ability; camels



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## 1. Introduction

Identification of factors that influence milking ability has decisive implications for milking management and adjusting the machine milking design and settings for camels. Udder morphology and functional milking traits are the most important factors determining machine milking ability of dairy animals. Selection programs, but also farmer selection for better animals to keep and breed should consider the impact of teat and udder characteristics on milking ability. It has been shown that udder and teat morphologies are very heritable [1] and have direct repercussion on machine milking ability in dairy