

1 **Effect of parturition time and climatic conditions on milk productivity, milk quality and**
2 **udder morphometry in Saanen goats in a semi-intensive system**

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7 **SUPPLEMENTARY FILE**

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9 **Supplementary materials and methods**

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11 *Animal and management conditions*

12 The effects of time of parturition and parity on milk yield, physicochemical composition and
13 SCC characteristics of Saanen goats were evaluated. The averages for ambient temperature,
14 precipitation, and relative humidity were provided by the meteorological station in Konya.

15 The daylight length was calculated from the official times of sunrise and sunset for the region.

16 The farm and pasture field were 1015 m above mean sea level, the annual average
17 temperature of 12 °C and total precipitation of 248 mm period of in this study. The ambient
18 temperature, relative humidity and photoperiod light duration ranged from -7 to 33 °C, 37 to
19 82% and 10 h, 15 min to 15 h and 17 min, respectively, during the lactation period (Figure 1).

20 Data included 2050 records (morning and evening) collected on 106 Saanen goats raised in
21 special a farm Konya of Turkey. Parities varied from one to four and weights from 33 to 58
22 kg. In winter, animals were kept indoors if grazing were not possible, they were fed with hay
23 (mixed 800 g alfalfa and 400 g wheat) and 1000 g concentrated feed (2450 kcal/kg ME, 15%
24 crude protein) for about 3 months. The annual dry matter (DM) production of rangelands in
25 the region produces about 400 kg of DM ha⁻¹ y⁻¹ with the main productive period being May

26 to July. The goats grazed about stocking density 0.5 goats/ha, on a natural pasture included
27 herbaceous, annual and perennial plant species. The pasture area consisted of 21.7% *Juncus*
28 *maritimus*, 16.7% *Juncus gerardi*, 12.2% *Inula aucherana*, 7.8% *Allium sp.*, 2.8% *Bromus*
29 *tectorum*, 1.8% *Centaurea depressa*, 1.0% *Consolida orientalis*, 1.0% *Aegilops ovata*, 0.8%
30 *Anthemis tinctoria*, 0.8% *Phleum exaratum* 0.5% *Agropyron repens*, 0.5% *Apera intermedia*,
31 0.3 % *Briza humilis* and 30.8 % of bare area. Goats were kept in pasture from February to
32 November. The daily grazing duration of the goats ranged from 4 to 6 h. In addition to
33 pasture, the goats were fed approximately 800 g d⁻¹ concentrate daily (17.1% CP, 2600 kcal
34 ME kg⁻¹ DM), and 400 g d⁻¹ a of dry alfalfa hay during the lactation period. Concentrate feed
35 was given two times a day during milking. Mineral supplements in the form of mineral blocks
36 were used on flock as to improve production and animal health in feeding periods. All the
37 goats were regularly vaccinated against the major epidemic diseases in Turkey and treated in
38 for internal and external parasites, and other treatments whenever needed. In a single-8
39 milking parlor, goats were milked from parturition to the end of lactation until dry. The goats
40 were mated using individual-mating system (hand mating), with one buck for every 15 goats.
41 The births began in the middle of February and lasted until the middle of March. During the
42 kidding period, the goats were observed hourly during the day and every two hours at night.
43 The new-born kid's date of birth, time of birth, type of birth, gender, and maternal tag number
44 were all recorded. After birth, the kids were allowed to suckle their mother's milk (colostrum)
45 for the first three days, then separated from their mothers and fed with a bottle until weaning.
46 The weaning ages of kids were approximately 2 months.

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48 *Milking, milk samples, SCC and udder measurements*

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50 All goats on the farm were milked twice a day, at 06:00 and 18:00 h, as a daily norm during
51 the lactation period. By using in-line milk meters every 28 days, both the milk yield of
52 individual goats was recorded and a milk sample of each goat was collected into tubes in
53 equal volumes (Tru-Test, Auckland, New Zealand). The goat's milk production was measured
54 until their daily production level dropped below 100 g d⁻¹. Only 18 goats were dried off or
55 removed from the study following completion of 36-week (ninth milking) of lactation period
56 when they decreased milk production or developed health problems. Lactation milk
57 productions were calculated by using the Fleischmann method (ICAR, 2009).

58 Milk samples were collected from each goat and fat, protein, lactose, solids-non-fat, total
59 solid, density, conductivity, and freezing point were immediately analysed in the field by an
60 ultrasonic milk analyser (MILKANA EP 45 sec Milk Analyser, Mayasan Ltd, Turkey). The
61 milk pH was measured by a pH meter (WTW, InoLab, pH 720, Weilheim, Germany). SCC in
62 the milk samples was determined by direct microscopic SCC method (Erduran, 2021).

63 Udder measurements were taken only once after the morning milking from each animal,
64 at approximately 84 days (peak period) of lactation and, in taking udder measurements were
65 utilized the principles reported by Mavrogenis *et al.* (1988). Also, udder volume (UV) was
66 calculated with the method reported by Emediato *et al.* (2008).

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68 *Udder measurements*

69 Udder teat length, udder teat diameter, distance between udder teats (DBUT) and rear udder
70 depth were measured with calliper. Udder circumference was measured with measurement
71 tape.

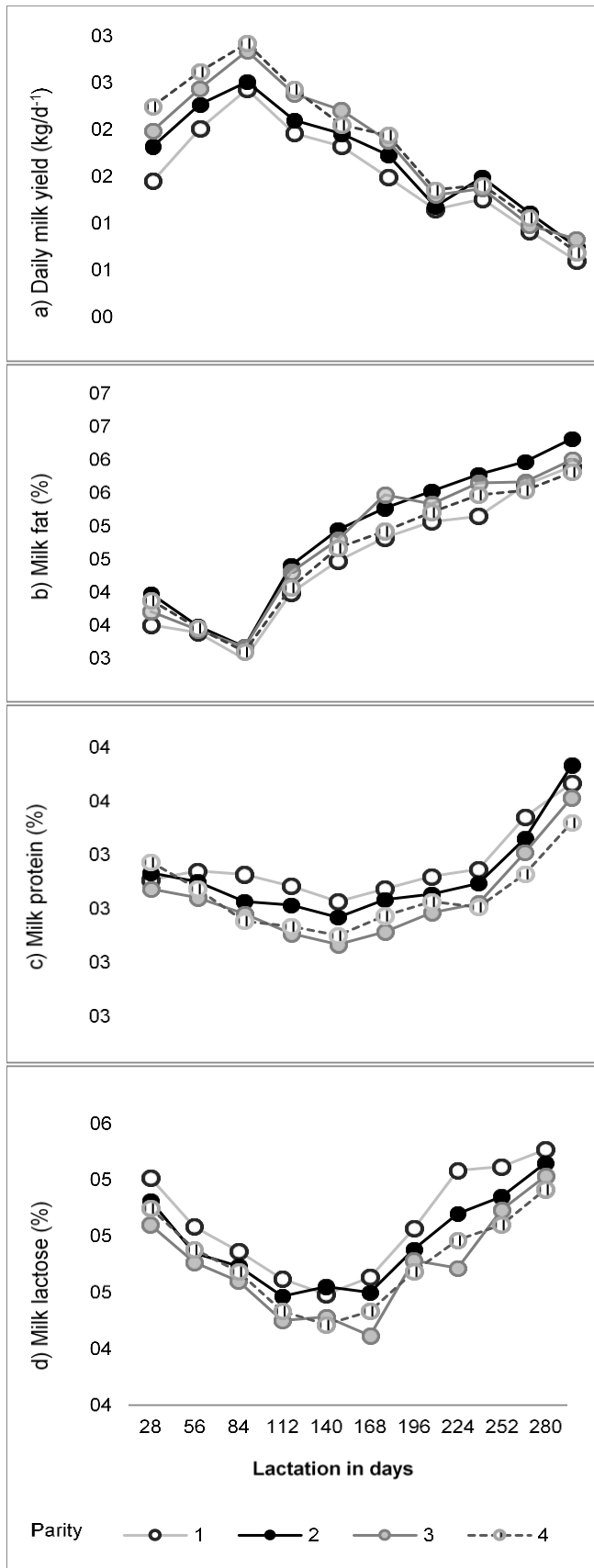
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76 **Supplementary Figure S1.**



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78 Changes in daily milk yield, fat, protein and lactose contents parity during lactation.