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Presenter Information

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Effect of the pasture on milk production from Cinisara cows over the seasons

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Key words: dairy cow, milk, pasture, production season

Introduction Cinisara is a Sicilian autochthonous breed of dairy cow and its milk is processed to make Caciocavallo cheese. The pasture is the basis of the diet during all the year, but its production is not continuous and homogenous, because of environmental constraints (Alabiso *et al.* 2005). The feeding integrations are concentrate, hay and or straw and their quantities given to the animals are different during the year in relation to the pasture resources. The aim of this research was to study the effect of the pasture on milk production from Cinisara cows over the seasons.

Materials and methods The effect of 2 different pastures (H and L), during a year, on the milk produced by 30 Cinisara cows was studied in a farm situated near Cinisi (Pa) at 540 m a.s.l. H pastures are situated in a highland and the soils, which are not deep and very rocky, are classified as *Rhodoxeralfs*. The soils of L pastures, which are situated in a little declivity, are deep and sandy clay loam. The cows rotationally grazed the pastures over the day and night. In autumn, from 10/06/03 to 12/17/03, they were supplemented with 7.6, 0.9 and 4.0 kg animal⁻¹ respectively of fine bran (CP 18.1%, NDF 26.2%), concentrate (CP 21.6%, NDF 21.0%) and straw (CP 6.4%, NDF 73.2%); in winter, from 12/18/03 to 02/29/04, they received the same integrations but the quantities were respectively 6.4, 1.1 and 4.0 kg animal⁻¹. In spring, from 03/01/04 to 06/16/04, the cows received only 4.9 kg animal⁻¹ of fine bran, while in summer, from 06/17/04 to 09/29/04, 5.6 and 9.0 kg animal⁻¹ respectively of fine bran and cladophylls of prickly pear (CP 8.3%; NDF 31.1%). Over the trial the number of animals in production was always constant according with the phase of lactation. Daily milk yield was recorded and massive milk samples, collected every 3 days, were analyzed. Yield in cheese was observed after 24 h. At the same time, every 15-20 days, representative samples of herbage selected by the cows were collected. Feed samples were analyzed. The milk data were analysed using ANOVA, which considered the production season (1, 5), splitting the spring in 2 periods (from 03/01/04 to 04/18/04 and from 04/19/04 to 06/16/04), the pasture (1, 2) and their interaction. All comparisons between the least square means were carried out with the student.

Results and discussion Pasture H showed a better chemical composition than L, because of the good ratio between legumes and grasses. The CP content in L was greater than in H and its value was respectively 19.3 and 17.4% on average. Both pastures produced the better and the worse biomass quality respectively in spring and in summer. From the autumn to the end of the winter the NDF content was for both pastures 41.6% on average; whereas from the spring to the summer, L showed a lower NDF content than H equal to 43.6 and 46.0% respectively. Different milk variables were influenced by the production season (Tab. 1), but not by the different pastures. The milk yield was greater in spring and lower in summer ($P \leq 0.001$). The protein and the casein contents were lower in summer ($P \leq 0.001$) probably due to the greater fiber content of the diet in this season, which could reduce the digestibility. However, the casein content showed good values for cheese making in all seasons. The K20 and A30 variables showed the best values in winter and in spring and the worse in summer ($P \leq 0.001$). For all of these reasons, the yield in cheese after 24 h was lower in summer ($P \leq 0.01$).

Table 1 Milk variables over the production season.

	Autumn	Winter	Early spring	Late spring	Summer	Season effect
Milk yield (kg animal ⁻¹)	11.0CDa	12.4BCb	12.6BCb	12.9Bb	9.8ADa	***
Fat (%)	3.4	3.4	3.4	3.3	3.3	N.S.
Protein (%)	3.5Bb	3.7Cac	3.6BCab	3.6BCbd	3.2Ae	***
Casein (%)	3.1BCbc	3.2Bb	3.1BCbc	2.9Cc	2.7Aa	***
r (min)	12.50	13.46	13.58	11.20	11.95	N.S.
A30 (mm)	40.1BCb	31.9ABad	42.7BCbc	48.4Cc	24.0Ae	***
K20 (min)	2.93ABa	2.50Bab	1.97Bb	1.93Bb	3.86Ac	***
Yield in cheese at 24 h (%)	11.4Ba	11.4Ba	11.2ABa	11.1Ba	10.0Ab	**

* = $P \leq 0.05$; ** = $P \leq 0.01$; *** = $P \leq 0.001$; A, B, C: $P \leq 0.01$; a, b, c: $P \leq 0.05$

Conclusions The summer produced the worse pasture biomass and showed the worse milk yield and quality. The different pastures did not influence the milk variables.

Reference

Alabiso M., Giosuè C., Alicata M. L., Parrino G. 2005. The milk yield by Cinisara cows in different management systems: note 2. Effects of season of production. *Proceeding of a satellite workshop of the XX International Grassland Congress, Glasgow, Scotland, July 2005* 201.