The Milk Yield by Cinisara Cows in Different Management Systems: 1. Effect of Season of Calving

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Introduction The Cinisara cow is Sicilian autochthonous breed; the milk has very interesting qualitative characteristics (chemical, physical and technologic parameters, principally due to its high part β of K casein) and is processed to make Caciocavallo cheese. Characteristics of milk yield are influenced by exogenous factors, such as management system, lactation number and season of calving. Pastures provide the basic feed but grazing is not continuous through the year. The aim of this research was to optimize the distribution of production over the year through the study of the effect of season of calving on qualitative characteristics of milk from Cinisara cows on three farms located at different altitudes (P=plain, C=hill and M=mountain) near Trapani.

Materials and methods The study was carried out over 16 months, from August 2001 to November 2002, on three different farms and on 60 cows, 52 pluriparous (P) and 8 primiparous (p), that completed their lactation over the period of study. The farms and the pastures were located: P, at 280 m a.s.l.; C, at 750 m a.s.l.; and M, at 1000 m a.s.l. The manual milking was made with the calf that ingested approximately 0.25 of the milk yield.

Table 1 Description of system of milk production

Farm	Cows	Grassland	Feeding daily supplement (kg/cow)
P	13 P 1p	Mainly sulla	Lucerne hay (12-14); feed (6-8)
C	28 P 2p	Mainly clover; at the end of the winter and beginning of the spring, sulla and vetch	Sulla hay (10); feed (4-5)
M	11P 5p	Non-homogeneous pasture	Sulla hay (10-12); feed (6-7)

Measurements were made of daily bulk milk yield and quality through the analysis of individual and bulk milk samples collected every month. Experimental data were analysed using ANOVA, a factorial model that considered the effect of season of calving, farm and lactation number.

Results The cows mainly calved in spring (38.3%) and autumn (35.0%) with less in winter (15.0%) and in summer (11.7%). The results are reported in Table 2. Spring calving was supported by a good availability of forage. Autumn as the season of calving produced the highest total milk yields. The length of lactation was significantly shorter in summer than in other seasons. The cows that calved in the autumn and in winter could use pasture which was of high quality over a longer time. Grazing and lactation yields for summer-calving cows were limited by high temperatures. The protein content of the milk was higher in autumn- and summer-calving cows than winter and spring-calving cows. Farm M recorded longer lactations than Farm C.

Table 2 Effect of season of calving, farm and lactation number on production variables

Factor	Treatment	Total milk yield (kg)	Length of lactation (d)	Milk (kg/d)	Fat (%)	Protein (%)	Lactose (%)	SCC (x 1000/ml)
Season of calving	Autumn	2241^{A}	214^{Aa}	10.2^{a}	3.7	3.7^{Aa}	5.0	549^{a}
	Winter	2126^{A}	225^{Aa}	9.4^{ab}	3.8	3.4^{ABbc}	5.0	417^{a}
	Spring	1964^{A}	196^{ABa}	10.2^{a}	3.6	3.4^{Bb}	5.2	395^{a}
	Summer	1116^{B}	155^{Bb}	7.2^{b}	3.8	3.7^{ABac}	4.9	940^{b}
Farm	P	1922	197^{AB}	9.6	3.6^{ABa}	3.6	5.1	471
	C	1748	177^{A}	9.8	3.5^{Aa}	3.5	5.1	532
	M	1916	219^{B}	8.3	4.0^{Bb}	3.6	4.9	723
Lactation number	1st	1595^{a}	174^{A}	9.0	3.9	3.6	5.1	339^{A}
	2nd and over	2129^{b}	221^{B}	9.5	3.6	3.5	4.9	812^{B}

Within columns values with different capital and small letters are significant at $P \leq 0.01$and $P \leq 0.05$.

Conclusions The Cinisara breed of cow has considerable potential, through optimising the distribution of births during the year, to produce milk, cheese and ricotta in different seasons of the year.