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EFFECT OF GRASS SILAGE SUPPLEMENTATION ON PERFORMANCE AND MILK FAT FATTY ACID COMPOSITION IN GRAZING DAIRY COWS

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INTRODUCTION

The Azorean archipelago, located in the Atlantic Ocean, is an important dairy region, being responsible for 27% of total milk production of Portugal. Its climate conditions allow the grazing of animals during all year round. The increase in genetic potential of dairy cows has led to supplementation during periods of lower pasture availability (winter), mainly grass silage.

MATERIALS AND METHODS

Sixteen multiparous Holstein cows (145 DIM; 24 kg milk/day) were assigned to dietary treatment sequences in a changeover design (4 × 4 Latin Square). Each experimental period lasted for 3-wk. The treatments were as follows: **PC**, 20 h access to grazing pasture supplemented with 6 kg/d of ground maize-based concentrate mixture (96% maize); **PCSB**, 20 h access to grazing pasture supplemented with 6 kg/d of maize and soybean meal-based concentrate mixture (78% maize and 18% soybean meal); **SC,** 7 h diurnal access to grazing pasture, and 13 h nocturnal *ad libitum* access to grass silage supplemented with 6 kg/d of maize; and **SCSB**, 7 h diurnal access to grazing pasture, and 13 h nocturnal *ad libitum* access to grass silage supplemented with 6 kg/d of soybean meal concentrate.

RESULTS AND CONCLUSION

Results concerning animal performance are shown in Table 1. Milk yield was not affected by treatments and milk fat concentration increased (P<0.06) with dietary SBM inclusion. Grass silage supplementation decreased milk protein concentration and improved the BW of cows.

Table 1 - Least square means for DMI, milk production, milk composition, and BW from the different dietary treatments.

	PC	PCSB	SC	SCSB	SEM	Effects		
						Silage	Conc.	SilagexConc
n	16	16	16	16				
DMI								
Pasture, kg/d	14.7	14.7	6.8	7.4	0.33	<0.001	0.268	0.202
Silage, kg/d	-	-	7.8	7.9	0.11	-	0.379	-
Concentrate, kg/d	5.3	5.3	5.3	5.3	0.01	0.294	0.294	0.294
Total, kg/d	20.0	20.0	19.8	20.6	0.28	0.263	0.050	0.029
Milk								
Yield, kg/d	25.3	24.7	24.7	25.9	0.75	0.510	0.466	0.073
Fat, %	3.69	3.79	3.60	3.78	0.103	0.449	0.066	0.492
Protein, %	3.26	3.24	3.13	3.15	0.055	<0.001	0.974	0.457
BW, kg	569	566	576	580	12.1	0.008	0.909	0.399

Results of milk FA profile are presented in Table 2. Treatments had not resulted in a pronounced effect on milk fat FA profile. The concentration of stearic, linolenic, CLA and transvacenic acid (18:1, *trans* 11 - TVA) did not differ significantly among treatments, as FA profile of pasture and direct cut silage were very similar. Silage increased concentration of 11:0, 12:0, 14:0 and 15:0 and decreased 18:1 cis-9 and 18:2 n-6. The sums of odd, branched and odd plus branched FA increased with silage, while both hypocholesterolemic fraction and ratios hypocholesterolemic/hypercholesterolemic and n-6/n-3 were lower.

Table 2 - Least square means for milk fatty acid profiles from the different dietary treatments.

FA **(g/100 g FA)**	PC	PCSB	SC	SCSB	SEM	Effects		
						Silage	Concentrate	SilagexConc
12:0	3.00	2.95	3.40	3.23	0.126	<0.001	0.182	0.459
iso 14:0	0.12	0.11	0.11	0.11	0.006	0.612	0.823	0.342
14:0	10.86	10.79	11.86	11.43	0.275	<0.001	0.236	0.406
iso 15:0	0.70	0.67	0.73	0.76	0.026	0.026	0.995	0.278
anteiso 15:0	1.02	1.01	1.20	1.13	0.085	0.003	0.394	0.563
15:0	1.19	1.14	1.38	1.37	0.033	<0.001	0.364	0.490
iso 16:0	0.30	0.29	0.28	0.28	0.013	0.219	0.999	0.683
16:0	26.02	26.93	27.77	27.10	0.973	0.298	0.901	0.390
iso 17:0	0.74	0.72	0.68	0.70	0.018	0.016	0.985	0.226
16:1 *cis-9*	1.28	1.34	1.37	1.36	0.076	0.350	0.759	0.541
anteiso 17:0	0.54	0.51	0.54	0.55	0.014	0.153	0.646	0.106
17:0	0.61	0.60	0.60	0.62	0.014	0.498	0.548	0.258
18:0	12.90	13.18	11.88	12.19	0.489	0.016	0.461	0.970
18:1 *trans-10*	0.39	0.34	0.44	0.30	0.063	0.947	0.142	0.496
18:1 *trans-11*	3.06	3.19	2.86	3.05	0.356	0.639	0.651	0.933
18:1 *cis-9*	23.91	23.60	21.30	22.76	0.686	<0.001	0.196	0.049
18:2 n-6	1.05	1.08	0.99	0.98	0.034	0.006	0.779	0.559
18:3 n-3	0.63	0.61	0.67	0.63	0.028	0.203	0.149	0.741
CLA *cis-9,trans-11*	1.43	1.37	1.47	1.49	0.180	0.673	0.899	0.830
Others	2.65	2.46	2.69	2.43	0.144	0.941	0.117	0.821

It was concluded that the utilization of a good quality, unwilted grass silage, seems to only slightly affect cow's performance and milk FA profile resulting in no significant impact on the main FA (CLA, TVA and omega-3).

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