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Seasonal variations of the intake of natural Mediterranean pasture in sheep

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The voluntary intake of pasture is a fundamental aspect of herbage evaluation since it sets the input of all nutrients and, therefore, determines animal response and function (Van Soest, 1982, Nutritional Ecology of Ruminants). It can account for, at least, 50 % of feeding value and is an important measurement in the evaluation of pasture feeding value (Ulyatt MJ, 1973, Chemistry and Biochemistry of Herbage, vol 3, 131-178).

The voluntary intake of Merino wethers, grazing a Mediterranean pasture (fertilized natural pasture) was measured, during 3 years, in autumn, winter, early spring, late spring and summer. The pasture was under evergreen oaks (Quercus ilex) with 20 trees / ha, subdivided in three plots (± 2 ha). The plots were continuously grazed by three esophageally fistulated and six non-fistulated Merino wethers. Organic matter digestibility (OMD) was estimated using indigestible NDF as internal marker (144 h *in vitro* incubation, Lippke *et al*, 1986, J Dairy Sci, 69, 403-412) dosed in esophageal and faeces samples. The faecal output of five intact animals was measured by the total collection method, harnesses being used. In each control period esophageal samples and total faeces were collected for 7 days. The OM intake (OMI) was estimated by the equation : OMI = OM excreted / (1-OMD).

The digestible OMI (DOMI, g/day/$LW^{0.75}$) was affected by the season with higher values in early spring and autumn and lower values in late spring and summer. Stepwise multiple regression analyses were established for each season. The variables used were OMD, crude protein (CP), hemicellulose (HEM) and cellulose (CEL) content of esophageal samples, legumes (LEG) and weeds (WEED) percentage of the pasture, total OM per hectare (TOM) and metabolic live weight ($LW^{0.75}$). Independent variables that didn't contribute to a significative increase (+2 %) of the multiple coefficient of determination (r^2) were eliminated. Other variables were tried but were not important.

The linear expressions, for DOMI, were :

		r^2	F
Autumn	-22.6 + 0.91 OMD + 0.65 WEED	0.59	19^{***}
Winter	-21.44 + 3.92 CP - 0.78 LEG - 0.02 TOM	0.82	53.45^{***}
Early Spring	-173.31 - 1.05 OMD + 4.16 CP + 1.76 HEM	0.62	21.46^{***}
Late Spring	154.42 - 3.94 CEL	0.63	36.88^{***}
Summer	4.87 + 0.43 OMD - 0.39 $LW^{0.75}$	0.57	22.28^{***}

Period	kg OM/ha	OMD (%)	DOMI (g/d/$LW^{0.75}$)	LWG (g/day)
Autumn	551^{cd}	62^{c}	35.6^{ab}	170^{a}
Winter	424^{d}	68.4^{b}	35.2^{b}	110^{b}
Early Spring	1381^{b}	75.4^{a}	39.7^{a}	137^{b}
Late Spring	2094^{a}	61.9^{c}	27.9^{c}	-14^{c}
Summer	1110^{bc}	49^{d}	17^{d}	-140^{d}

$^{a, b, c, d}$ means in the same column with different superscripts differ significantly at $P<0.001$