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# Nutritive value of cereals grown in Apulian places

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## ABSTRACT

The new EU Common Agricultural Policy by the de-coupling measure provides the same subsidy for any crop which respects good economic and environmental conditions; hence the need to identify crop systems which give a better yield in relation to the soil fertility, climatic conditions and species adaptability. The aim of the study was to evaluate the chemical composition and the nutritive value of cereals such as spelt (cultivar Davide), durum wheat (cultivar Portobello), rye (cultivar Askari) and two cultivars of barley, Dasio and Otis. The cereals were grown in 3 Apulian places: Gravina di Puglia (BA), Monopoli (BA) and Monteroni (LE), very different among each other for the climatic conditions and pedological features of soil (fertility, texture and composition). In vitro gas production was assessed by the Menke and Steingass (1988) technique, checked until 72 h and expressed as ml/g DM. The metabolizable energy (ME; MJ/kg DM) was calculated as:  $1.06 + 0.157GP + 0.084CP + 0.22CF - 0.081CA$ , where GP is 24 h net gas production (ml/g DM), CP, CF and CA are crude protein, fat and ash (% DM), respectively. Data were processed by ANOVA according to a 5 (cereals tested) x 3 (cultivation places) experimental model. Student's t test was used to compare differences between means. The CP content of all the cereals tested was higher in crops grown in Gravina compared to Monopoli and Monteroni, with particular regards to durum wheat (13.60 vs 10.97 and 10.35,  $P < 0.01$ ), rye (14.27 vs 7.83 and 7.75,  $P < 0.01$ ) and spelt (13.25 vs 12.16,  $P < 0.05$ ; vs 11.87,  $P < 0.01$ ). The CP content of both the cultivars of barley was significantly lower in Monopoli (Dasio: 11.40 vs 13.16 and 12.75, respectively for Gravina and Monteroni,  $P < 0.01$ ; Otis: 8.20 vs 12.61 and 11.34,  $P < 0.01$ ).

Temperatures above 30 °C and dry winds during late Spring may have affected final kernel weight by reducing the duration of grain filling, due to the suppression of current photosynthesis and by inhibition of starch synthesis in the endosperm. Thus, kernels remain thin and show a lower hectolitre weight and a higher CP percentage as a consequence of the greater incidence of the pericarp on the total kernel weight. This is a typical situation that occurs in South Italy areas, due also to the features of the marginal lands. Indeed, the occurrence of a reduced production of starch may be hypothesised since a lower amount of GP was found, especially for barley (Dasio) and rye grown in Gravina, characterised by poor soils. The ME of durum wheat and rye did not differ among places, while barley cultivars displayed a different trend: the ME of the Dasio cultivar grown in Gravina was significantly lower compared to Monopoli and Monteroni (12.23 vs 13.33 and 13.22,  $P < 0.01$ ). On the other hand the ME of the Otis cultivar grown in Gravina (13.26) was similar to that of Monteroni (13.23) but significantly greater compared to Monopoli (12.54,  $P < 0.05$ ). For spelt the best ME was recorded in Gravina (12.36 vs 11.52,  $P < 0.05$ ), despite the hostile conditions of this place. Therefore, it may be assumed that the greater rusticity of this cereal allows a better adaptability to marginal areas and its use as a convenient ingredient for the ruminant diet.