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## H, C, N, O and S stable isotope ratios of livestock from Cameroon

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### Abstract

70% of the population in Cameroon is economically dependent on agriculture, essentially represented by livestock production. There are around six million cattle in Cameroon, mostly belonging to the *Zebu* breed. In order to improve meat and milk productivity for the *Gudali zebu* breed in Cameroon, international cooperation between Italy and Cameroon has recently been started up. Within the context of this cooperation, 60 samples from three different cattle species (*Gudali*, *White and Red Fulani*) from different parts of Cameroon (the Sudano-Sahelian area in the North, Guinea high savannah in the East, high plateau in the West and forests in the South) were subjected to analysis of the <sup>13</sup>C/<sup>12</sup>C, <sup>15</sup>N/<sup>14</sup>N, <sup>34</sup>S/<sup>32</sup>S, <sup>2</sup>H/H and <sup>18</sup>O/<sup>16</sup>O ratios of defatted dry matter and the <sup>13</sup>C/<sup>12</sup>C, <sup>2</sup>H/H and <sup>18</sup>O/<sup>16</sup>O ratios of fat, using IRMS after combustion or pyrolysis. Stable isotope ratios of bio-elements have already been shown to be capable of characterising meat products on the basis of animal diet and the geo-climatic characteristics of the area of provenance (Camin et al., 2007; Perini et al., 2009; Schmidt et al., 2011). Livestock from Cameroon are characterised by typical  $\delta^{13}\text{C}$  values, due to an animal diet based on C4 plants (such as *Echinochloa* or *Panicum*) and  $\delta^{34}\text{S}$  values.

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## Evaluation of stilbenes content in grapes (cv. *Uvalino*) during ripening and drying

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### Abstract

The chemical compounds belonging to the stilbenes have recently received a particular attention due to the role they play in the plant's physiology (phytoalexins) and for their anti-oxidant properties. The *Uvalino* is a red-berry grape variety typically grown in Piedmont, Italy. This cultivar is characterised by its ability to synthesise large amounts of resveratrol glucoside (*trans piceid*) [ref]. This explains its high resistance to *Botrytis cinerea*. The aim of the work is the evaluation of stilbenes and other phenolics during ripening and drying of *Uvalino* grapes. After accumulation, values for *trans-piceatannol* and *trans-pterostylbene* remain constant during the whole ripening period, while the *piceide* isomers continue to be synthesized until vintage. At the harvest the most abundant stilbene appears to be the *piceide* (*trans* and *cis*) and *trans-pterostylbene*, while *trans-piceatannol* is the lowest. The amount of total stilbenes found is remarkably higher than in other Piedmontese, Italian and international wines. Due to the high levels of resveratrol also in the *Uvalino* wines, the study of the different stilbenes found in grapes, both in their glucoside and free forms, could be interesting for nutraceutic purposes, or alternatively, be used as a varietal marker. The determination of the stilbenes during ripening, suggests that their synthesis begins at veraison, as for anthocyanins, but the stilbenes accumulation in berries happens suddenly. The high content in stilbenes and the low quantity of anthocyanins are a varietal character. The amount and the evolution of stilbenes and other phenolic compounds have been monitored during drying in a drying room and over-ripening on the plant. As expected, the berries drying process appears to be more intense in grapes placed in a drying room, while all compounds are reduced when drying takes place directly on the plant, irrespective of the calculation method. During grape drying, stilbenes and flavonols show large percentual reductions, even though the formers are higher, both at vintage and after drying. When drying takes place under optimal temperature and humidity conditions, as in the drying room, the values of the main phenolics indices are higher than those found at vintage. On the other hand, on the plant, the reductions are far more important, with the exception of stilbenes and hydroxy-cinnamic acids.