

## In Vitro Digestibility of Grains and Straw of Seventeen Ecotypes of Bitter Vetch (*Vicia ervilia*) in the North of Morocco

**Authors :** Boukrouh Soumaya, Cabaraux Jean-François, Avril Claire, Noutfia Ali, Chentouf Mouad

**Abstract :** The introduction of marginal leguminous forage species in the diet of ruminants are of great importance. Bitter vetch is a good source of proteins, highly resistant against drought and poor soil conditions. Accordingly; two years field trials (2018/2019 and 2019-2020) were conducted to determine the digestibility of straw and grains of 17 promising bitter vetch ecotypes (*Vicia ervilia*) in the north of Morocco. In vitro dry and organic matter digestibility, gas production, and kinetics of fermentation of grains and straw were evaluated using gas production technique, pepsin-cellulase enzymatic digestibility of DM (CDDM) and OM (CDOM), as well as protease enzymatic CP degradation (CPD) and in vitro true digestibility, were performed using DAISYII Incubator. In vitro digestibility was performed using gas production method of (Menke et al., 1979) improved by Menke and Steingass (1988). Samples were incubated in glass syringes that contained rumen fluid and incubation solution that conserved in water bath in 39°C during 72 hours. Gas production was recorded after 2, 4, 8, 12, 24, 48, and 72 hours. Studied digestibility parameters were dry and organic matter digestibility, microbial biomass production, partitioning factor, and volatile fatty acids. Enzymatic dry matter digestibility was different ( $p < 0.05$ ) among grains and straw for all ecotypes. It varied from 804.1 to 957.7 g/kg DM and 270.4 to 412.3 g/kg DM for grains and straw, respectively. Metabolizable energy varied between 11.7 to 14.3 MJ/kg DM and 2.6 to 5.0 MJ/kg DM for grains and straw, respectively. Potential gas production (A), the rate constants (c and d), and lag times of grains and straws from different bitter vetch ecotypes were different ( $p > 0.05$ ). The results emphasized that in any evaluation of bitter vetch ecotypes, where straw of this legume seed is used as an animal feed, not only seed yield but also yield and quality of straw should be taken into consideration, particularly in areas where straw from this legume is considered as an important feedstuff for ruminants. Enzymatic digestibility was lower than in vitro digestibility by gaz production and by the DAISYII method because rumen fluid contains bacteria than increase digestibility. There was no difference between in vitro digestibility by gaz production and the DAISY II method. The DAISY II method can be used to increase labor efficiency in the in vitro DM digestibility analysis if gaz production is not necessary for analysis.

**Keywords :** bitter vetch, grains, straw, ecotype, in vitro digestibility, gaz production, enzymatic digestibility

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