

Feeding value of hazelnut, chestnut, mulberry and grapevine leaves and honey locust pods for ruminants

Martin Hünerberg¹, Janos Wack², Theresah Serwaa Sarfo¹, Jürgen Hummel¹

¹Department of Animal Sciences, University of Göttingen, Germany, ²Triebwerk UG, Meißner, Germany



Objectives

This study investigates the composition of **hazelnut** (*Corylus avellana*), **chestnut** (*Castanea sativa*), **mulberry** (*Morus rubra*) and **grapevine laves** (*Vitis vinifera*), as well as **honey locust pods** (*Gleditsia triacanthos*).

Materials and Methods

- The fresh leaves were harvested in mid-August and beginning of October 2024 from an established agroforestry system in Meißner (Hesse, Germany).
- Samples were hand harvested from different plants and two pooled samples (n=2) per species were subjected to chemical analysis.
- Mature pods from honey locust were harvested from six different varieties (n=6) in a nursery located in Au am Inn (Bavaria, Germany).
- The composition of the leaves and pods was analyzed according to standardized methods of the Association of German Agricultural Analytic and Research Institutes (VDLUFA, 2012).

Introduction

- Foliage from shrubs and trees can be a valuable feed resource, particularly for small ruminants (sheep and goats).
- The nutrient composition of foliage however differs substantially among species and is also impacted by harvest date, climatic conditions and location.
- Overall, there is a lack of data describing the nutrient composition and feeding value of fresh foliage.

Results

- Hazelnut leaves had the highest fiber (518 g NDF, 308 g ADF; all per kg dry matter [DM]; see Table) and lowest ME content (10.1 MJ/kg DM).
- Mulberry had the lowest fiber (312 g NDF, 147 g ADF, 27 g ADL; DM basis) and highest ME content (12.4 MJ/kg DM).
- The level of crude protein (CP) in hazelnut (143 g), chestnut (130 g) and mulberry (137 g) was similar, whereas grapevine leaves contained 162 g CP/kg (all DM basis).
- The composition of honey locust pods varied substantially among varieties (365 to 461 g NDF, 254 to 323 g ADF, 113 to 151 g ADL, 9.9 to 10.9 MJ ME; all per kg DM). The sugar content ranged from 81 to 212 g/kg DM, depending on the variety, number of seeds and pod length.

Table Composition of hazelnut, chestnut, mulberry, and grapevine leaves (n=2) and honey locust pods (n=6).

Parameter ¹	Hazelnut leaves	Chestnut leaves	Mulberry leaves	Grapevine leaves	Honey locust pods
Organic matter, g/kg	914	956	890	916	956
Crude protein, g/kg	143	130	137	162	116
Neutral detergent fiber ² (NDF), g/kg	518	462	312	375	423
Acid detergent fiber ² (ADF), g/kg	308	253	147	210	286
Acid detergent lignin ² (ADL), g/kg	170	116	27	89	128
Total lipids, g/kg	35	37	45	45	19
Sugar, g/kg	68	93	96	85	135
Starch, g/kg	-	-	-	-	2.7
Metabolizable energy, MJ/kg	10.1	10.9	12.4	11.5	10.4

¹All values are expressed on a dry matter (DM) basis. ²Expressed without residual ash. ADF was analyzed sequentially.

Main findings

- Mulberry leaves had a particularly low fiber and high energy content that is comparable to very high-quality grass.
- Honey locust pods can contain substantial amounts of sugar but almost no starch.
- Their energy content can be variable but should not be overestimated in practical feeding.

Reference: VDLUFA (2012) Handbuch der Landwirtschaftlichen Versuchs- und Untersuchungsmethodik (VDLUFA-Methodenbuch), Bd. III. Die chemische Untersuchung von Futtermitteln, VDLUFA-Verlag, Darmstadt, Germany (in German). This project (FuLaWi) is funded by the German Federal Ministry of Agriculture, Food and Regional Identity.

Contact: martin.huenerberg@uni-goettingen.de

<https://www.instagram.com/futterlaub/>

