



# Dried tomato vines in substitution to alfalfa hay to feed Barbarine lambs: Effects on diet intake, growth performances and carcass quality

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## ARTICLE INFO

### Keywords:

Barbarine lambs  
Tomato vines  
Carcass  
Alfalfa  
Growth  
Offal

## ABSTRACT

Tomato vines are a by-product of tomato plants pruning at different stage of growth and production. Large quantities of tomato vine biomass are produced and accumulated near greenhouses and cause environmental problems. Tomato vines could be used (DTV) as dry roughage to feed livestock. The objective of this study was to evaluate the effects of substituting dried tomato vines (DTV) to alfalfa hay at two levels (50% and 75%) on feed intake, growth performances, non-carcass components, and carcass characteristics of Barbarine lambs. Twenty four 8 months-old Barbarine lambs, with an average weight of 31 kg, were divided into three groups of 8 each and fed diets with different compositions of the roughage portion: the A1100 group received only alfalfa hay as forage, the A150-T50 group received equal portions of alfalfa hay and DTV, and for the T75-A125group, the roughage portion was composed of 75% of DTV and 25% of alfalfa hay. All lambs received the same amounts of forage (increasing from 1000 to 1400 g) and the same quantities of concentrated feed (increased from 500 to 700 g). The trial lasted 88 days, after which all of the animals were slaughtered. It was found that substituting DTV to alfalfa hay at the level of 50% had no effect on roughage and total diet intake. In addition, DTV intake did not affect the slaughter weight ( $P > 0.05$ ), although the average daily gain and total weight gain were 136 g and 11.5 kg for the A1100 and A150-T50 groups vs. 125 g and 9.6 kg.; for the T75-A125 group. Overall, carcass yields and non-carcass components were similar for the three groups of lambs. However, DTV incorporation at the levels of 50% and 75% resulted in leaner carcasses for both tomato groups compared with the A1100 group (54.3 vs. 49.9% of muscle and 24.4 vs. 28.8% of fat, respectively). Nevertheless, the highest level of tomato incorporation (75%) promoted the development of the leaner second meat grade (SMCC) (18.2%;  $P = 0.02$ ) compared to the medium (50%) and null level (0%) of DTV incorporation, which resulted in the same proportion of SMCC (17.5%).

## 1. Introduction

The combined effects of climate change, land degradation, non-availability of land for fodder production, water scarcity, and the high cost of inputs have increased the cost of feed ingredients such as cereals (Wadhwa et al. 2015) and contributed to shortages of livestock feed resources to meet herds' needs. Moreover, with the increasing livestock population, the pressure on feedstuffs availability increased. Hence, many developing countries face feed shortage (Kiran et al. 2012). Nevertheless, new nonconventional alternative feed resources could be efficient in addressing this situation. The search for classic feed ingredients' substitutes such as fruits and vegetables by-products and their

use create the perfect solution for developing new feed resources using unconventional or under exploited agro-industrial co-products. In fact, reducing the environmental impact of human activities is one of the most difficult challenges. The United Nations (UN) Agenda 2030 with 17 Sustainable Development Objectives (SDO) reflects the necessity of world leaders to improve policies and plans to preserve natural resources to guarantee environmental sustainability (Vastolo et al., 2022). In particular, objectives #2 and #9 focus on sustainability in agriculture and industry by reducing and recycling waste disposal and food wastes. To achieve the Agenda goals and contribute to cover livestock feed needs; the huge quantities of non-human-edible biomass waste generated during harvesting and post-harvesting along the food chain might

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<https://doi.org/10.1016/j.smallrumres.2023.107178>

Received 14 August 2023; Received in revised form 16 November 2023; Accepted 18 December 2023

Available online 28 December 2023

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