

Pomegranate peel rumen fermentation and gas production in vitro.

Muhammad Abdullah*

Department of Animal Science, Islamic Azad University, Shabestar Branch, Shabestar, Iran

Abstract

Using an in vitro gas generation approach, this study looked at the effects of adding different amounts of ace tonic extract of pomegranate peel on rumen fermentation kinetics of sunflower seed meal (SFM). The samples were cultured in syringes containing rumen fluid from three Iranian Ghezel rams with annulations. The inclusion of ace tonic extract of pomegranate peel resulted in an increase in gas generation volume across all incubation durations, according to the results. The amount of gas produced rose when the extract dose was raised. Pomegranate peel extract supplemented sunflower seed meal had higher levels of a (gas production from the immediately soluble fraction), b (gas production from the insoluble fraction), and a + b (potential gas production) than control meal. Pomegranate peel extract boosted estimated short chain fatty acid (SCFA) synthesis, as well as digestible organic matter (DOM), metabolizable energy (ME), and net energy for lactation (NEL) in SFM. Enhancing the level of extract supplementation improved SCFA production as well as DOM, ME, and NEL content in SFM. In conclusion, feeding ruminants with ace tonic extract of pomegranate peel may result in increased urine fermentation and improved nutritional value of SFM.

Keywords: Fermentation Kinetics, Metabolizable Energy, Pomegranate Peel Extract, Sunflower Seed Meal.

Introduction

Antibiotics, ionospheres, methane inhibitors, and defaunating agents have all been employed in ruminant feeding to promote rumen fermentation, with the goal of increasing the efficiency of milk and meat production in ruminants. However, because to the rise of multidrug-resistant bacteria, which may pose a risk to human health, the use of some of these chemicals in animal feeds has been restricted [1]. Antibiotics have been banned as feed additives in animal feeds in the EU since 2006 due to the risk of residues in milk and meat. Ruminant nutritionists and microbiologists have been pushed to investigate natural alternatives to these chemicals due to growing interest in organic farming and the contribution of ammonia and methane generated by ruminants to climate change. In the ruminant diet, a category of natural compounds known as plant secondary metabolites (PSMs) such as spooning or phenols have shown some potential as a nutritional strategy [2].

Pomegranate peel (*Punica granatum*) is a by-product of the pomegranate juice business that is high in polyphenols like saponins, ellagic tannins, ellagic acid, and gallic acid. Organic solvents are frequently used to extract PSMs from pomegranate peel [3]. However, because this approach is somewhat expensive, water extraction is becoming more popular. As a result, there is a need to explore the efficacy of a prospective low-cost approach that uses water as the solvent at the farmer level. The effect of adding pomegranate peel ace tonic extract on SFM in vitro gas generation volume at

various incubation durations has been demonstrated [4]. The inclusion of ace tonic extract of pomegranate peel resulted in a considerable increase in gas generation across all incubation durations, according to the results. Gas output is also improved by increasing the extract level. Amounts of gas produced from control SFM at various incubation durations were similar to our prior in vitro investigation, but not to Jolazadeh and Mohammadabadi's findings. The current study's findings were somewhat in accord with those of prior investigations [5].

Conclusion

Supplementing ace tonic extract of pomegranate peel to the rumen can result in higher in vitro gas and volatile fatty acid production, as well as metabolisable energy, net energy for lactation, and digestible organic matter content of sunflower seed meal for ruminants, according to the findings of this study. We were unable to precisely explain and justify the mechanisms underlying our findings, and additional research was required to evaluate such findings. In future investigations, it is advised that an additional "control" comprising rumen fluid-buffer containing extract, without the tested feedstuffs, be examined.

References

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*Correspondence to: Muhammad Abdullah, Department of Animal Science, Islamic Azad University, Shabestar Branch, Shabestar, Iran, E-mail: abdullah.muhamad@edu.ir

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