

Original Research Article

<https://doi.org/10.20546/ijcmas.2020.903.138>

## Effect of Green Coriander Leaves (*Coriandrum sativum*) and Sodium Bicarbonate on Deodorization of Goat Rumen Meat

Sushma Kumari<sup>1\*</sup>, Subhasish Biswas<sup>2</sup> and Sanjay Kumar<sup>3</sup>

<sup>1</sup>Department of LPT, BVC, Bihar Animal Sciences University, Patna, India

<sup>2</sup>Dept. of LPT, WBUAFS, Kolkata, W.B., India

<sup>3</sup>Department of LPM, BVC, Bihar Animal Sciences University, Patna, India

\*Corresponding author

### ABSTRACT

A study was conducted to deodorize the rumen meat (also known as tripe) with different levels of coriander and sodium bi-carbonate separately to overcome its off odor and to increase the acceptability of rumen meat for product preparation. Rumen meat contributes 2.8% of slaughtered weight of goat and is highly nutritious but not popular due to its unpleasant odor and poor functional properties. So, this experiment was conducted in order to find out the acceptability of rumen meat after proper deodorization. Therefore, after proper cleaning and washing with water, rumen was dipped in 0%, 5% and 10% of green coriander leaves paste and sodium bi-carbonate separately for 30 minutes and then washed with normal clean water. Results showed that 5% level of concentration of coriander and sodium bi- carbonate was found to be most suitable deodorizer than 10% level of concentration. At 5% level, although bleaching action was better by sodium bi- carbonate but on the whole deodorizing activity was good by herbal deodorizer green coriander leaves.

#### Keywords

Coriander,  
Deodorizer, Off-  
odor, Rumen meat,  
Sodium bi-  
carbonate

#### Article Info

Accepted:  
05 February 2020  
Available Online:  
10 March 2020

### Introduction

Goats constitute an important species among food animals in Asia and contribute greatly to meat and milk as source of animal protein, rural employment and Gross Domestic Product. Goats are widely distributed around the world, totaling more than 850 million and

representing about 1,156 different breeds (Devendra, 2010). On a global scale, goat meat consumption is less than beef (Madruga and Bressan, 2011), but goats undoubtedly serve as a staple source of red meat to humans, especially in developing countries. Globally, goat meat consumption increased during the past 20 years (Madruga and

Bressan, 2011). Ibrahim (2011) recently reported an increase in the importation of chevon from Australia and New Zealand to the USA due to an increasing immigrant population. India is the country that consumes the least meat per capita (Tepper, 2012). Animal protein foods are at the top of the food chain in relation to the resources (Chemnitz and Becheva, 2014) Demand for meat is growing in rapidly developing countries, particularly India, China and Brazil (Chemnitz and Becheva, 2014). Goats are slaughtered mainly for meat, the by-products that are emanated from slaughtered animals are also of good value. Rumen musculature or tripe accounts for 2.8 per cent of slaughter weight of goat but because of its off odors, toughness due to high collagen content, poor functional properties and low shelf-life, it is generally not preferred for products preparation.

In India most of the rumen meat is not properly utilized or condemned as waste because of socio-cultural issues and lack of technology. Very few attempts have been made to develop value added products exclusively from buffalo tripe (Anna Anandh *et al.*, 2008). Anandh (2017) prepared pickles from rumen meat of goat and buffalo. Some attempts have been made to utilize buffalo tripe as partial substitute for lean meat in the preparation of comminuted meat products (Anjaneyulu and Kondaiah, 1990). But these attempts have their own limitations for exploitation in commercial application because of its unpleasant odor and poor functional properties. In this perspective, it is essential to evolve appropriate technologies for reduction of unpleasant odor of rumen and for conversion of it into convenience, attractive and more acceptable novel products. To overcome this problem and to find means of better utilization, trails have been made for its proper deodorization to increase the product acceptability.

## **Materials and Methods**

About 250gm weight of goat rumen was purchased from small ruminant meat shop of local market of Kolkata. It was brought to the Laboratory of LPT, Dept. WBUAFS, Kolkata for further processing.

### **Cleaning of rumen and harvesting of rumen meat**

As per histology, the rumen has keratinized stratified squamous epithelium and is non-glandular. The interior surface of the rumen forms numerous papillae.

First the rumen was washed with clean water properly. Then the papillae layer was removed by soaking in hot water at 70<sup>0</sup> C for 10 minutes and then scrapping. Again it was washed in hot water at 70<sup>0</sup> C. The soft smooth rumen meat was then kept at 4±1<sup>0</sup> C for few hours for deodorization and further processing.

### **Deodorization of goat rumen meat**

Rumen meat has a typical off odor due to reminiscent of ingesta. Therefore it should be suitably treated to reduce or eliminate such off odor prior to its use for preparation of processed meat products. In the present study, trail was made to deodorize goat rumen meat by using sodium bi-carbonate and coriander leaves. The two ingredients viz. one analytical grade chemical sodium bi- carbonate and other herbal i.e. green coriander leaves were arbitrarily selected for evaluation of their efficacy for deodorization of goat rumen meat to see the comparative effect of chemical vs herbal treatment.

### **Basis for assessment of efficacy of deodorization**

The intensity of off odor and color bleaching effect in goat rumen meat, after treatments

with herbal and chemical solution separately were subjectively evaluated on 6- point hedonic scale by an experienced sensory evaluation panel, comprising of faculty members, post graduate and PhD students of LPT Dept., WBUAFS, Kolkata. One point was recommended for very strong intensity of off odor and for severe bleaching, while 6 point for not any off odor and for improved color.

**Procedure for selection of best deodorizer**

Analytical grade sodium bi-carbonate was taken for analysis at the concentration of 5% and 10% (w/v). Similarly green coriander leaves paste was prepared by mincing green coriander leaves with water (10%) in a mixer grinder and were taken at different concentration of 5% and 10% level (w/v). About 100g of goat rumen meat chunks were immersed in a glass beaker containing tap water to serve as control. Similar quantities of rumen meat chunks were immersed in glass beakers containing 5% and 10% levels of sodium bi- carbonate and green coriander leaves paste separately. Holding period for control and treatments were kept uniform i.e. for 30 minutes. During this period, the chunks were stirred at frequent intervals using glass rods to facilitate better contact of meat surfaces with the solutions. After 30 minutes, rumen meat chunks were removed and thoroughly washed under running tap water to wash off residual solution from the meat surfaces. Excess water was squeezed off and chunks were placed in clean plates. Sensory evaluation was conducted immediately

thereafter. Odor and bleaching effect of control and treatment samples were evaluated by the panelists. The intensity of off odor and bleaching effect were assessed by appropriate score as mentioned above in four trails of the experiment.

**Statistical analysis**

The data generated from four trials for each experiment were analyzed by following standard procedures of Snedecor and Cochran (1989) for comparing the means and to determine the effect of treatments and storage.

**Results and Discussion**

Results were evaluated for off odor and bleaching characteristics and table 1 showed the effect of different levels of deodorizers on off odors of goat rumen meat. Treatment of goat rumen meat with water was used as control and it has been represented as 0% concentration. The odor scores for samples treated with sodium bi-carbonate ranged from 1.4 to 5.6, while for green coriander leaves were ranged from 1.2 to 6.0. Treatment at 5% and 10% were found to be significantly ( $p < 0.05$ ) higher than control. Anna Anandh (2013) used 2.5% sodium bicarbonate as deodorizer for buffalo tripe. Results of bleaching scores of goat rumen meat, after treatment with 0% (control), 5% and 10% level of concentration with uniform holding time of 30 minutes are presented in table 2. Bleaching scores for sodium bi-carbonate ranged between 1.4 to 5.6 and for green coriander leaves ranged between 1.4 to 6.

**Table.1** Effect of different levels of deodorizers on off odour of goat rumen meat

Parameters	Treatments		
	T1 ( 0%)	T2 (5%)	T3 ( 10%)
Sodium bi-carbonate	1.4c + 0.24	4.6b + 0.24	5.6a + 0.24
Green coriander leaves	1.2c + 0.20	4.6b + 0.24	6.0a + 0

(Odor score based on 6 point hedonic scale, where 1= very strong off odor: 6= no off odor )

Means bearing same superscripts in a row didn't differ significantly (  $p < 0.01$  )

**Table.2** Effect of different levels of deodorizers on bleaching of goat rumen meat

Parameters	Treatments		
	T1 ( 0%)	T2 (5%)	T3 ( 10%)
Sodium bi-carbonate	1.4c + 0.24	5.6a + 0.24	4.2b + 0.20
Green coriander leaves	1.4c + 0.24	6.0a + 0	5.0b + 0

(Bleaching score based on 6 point hedonic scale, where 1= no colour improvement : 6= Colour improvement )

Means bearing same superscripts in a row didn't differ significantly ( p< 0.01)

Linearly and significantly higher odor scores were observed with increasing concentration. Although no significant differences were observed in bleaching scores between sodium bi- carbonate and coriander, however at 10% level rumen meat was found to be more bleached by sodium bi- carbonate than 5% and 10% level by coriander. The color of rumen meat at 10% level was found to be more greenish and dull than 5% level. Both chemical and herbal treatment gave beneficial effect and improved the color as indicated by significantly (p< 0.01) higher bleaching scores than control at 5% level. So, deodorization of rumen meat at 5% level was preferred and had better acceptability for product preparation. This results were in accordance with the findings of Anandh (2001). He used TSP at the concentration of 5% with a holding period of 30 minutes for deodorization of buffalo tripe. Kaori *et al.*, (2006) reported the deodorizing effect of coriander on the offensive odor of porcine large intestine.

In conclusion, 5% level of concentration of green coriander leaves and sodium bi-carbonate was found to be most suitable deodorizer than 10 % level of concentration. At 5% level, action of herbal deodorizer was found to be better over chemical deodorizer. Based on the results of sensory attributes, it can be concluded that goat rumen meat (tripe) can be successfully used for product preparation after proper deodorization.

### Acknowledgement

Faculty members and staff of the institution are thankful for their help in work.

### References

- Anandh, A.M. 2001. Studies on development of extruded tripe snack food from buffalo rumen meat. M.V.Sc. Thesis, Deemed University, IVRI, Izatnagar (U.P.).
- Anandh, A.M., Radha, K., Lakshmanan, V. and Mendiratta, S.K. 2008. Development and quality evaluation of cooked buffalo tripe rolls. *Meat Science*. 80: 1194-1199.
- Anandh, A.M. 2013. Effect of different tenderizers on tenderness and quality of buffalo tripe. *Asian J. Dairy & Food Res.* 32 (2): 144-148.
- Anandh, A.M. 2017. Quality and acceptability of tripe pickles from goat and buffalo rumen meat, *Food Sci.* 8:123-127.
- Anjaneyulu, A.S.R. and Kondaiah, N. 2009. Quality of buffalo meat nuggets and rolls containing edible by-products. *Indian J. Meat Sci. and Technol.*, 3(20): 95-99.
- Chemnitz, C. and Becheva, S. 2014. Meat Atlas Retrieved 24 February 2014 from: [www.foeeurope.org/meatatlas](http://www.foeeurope.org/meatatlas).
- Devendra, C. 2010. Concluding synthesis and the future for sustainable goat production *Small Rumin. Res.* 89: 125–130.

- Ibrahim, M. 2011. Consumer willingness to pay a premium for Halal goat meat: A case from Atlanta, Georgia J. Food Distribution Res. 42(1): 72–76.
- Kaori, K., Reiko, K., Hiroshi, K., Koji, S. and Yasuyoshi, H. 2006. Deodorizing effect of coriander on the offensive odor of the porcine large intestine. Food Sci. Technol. Res., 12(1): 38-42.
- Madruca, M.S. and Bressan, M.C. 2011. Goat meats: Description, rational use, certification, processing and technical developments. Small Rumin. Res.98: 39–45.
- Snedecor, G.W. and Cochran, W.G. 1989. Statistical methods. 8th Ed. Oxford and IBH Publishing Co., Calcutta, India.
- Tepper, R. 2012. ‘World’s meat consumption: Luxembourg eats the most per person, India the least’. The Huffington Post; [4 May 2012].

**How to cite this article:**

Sushma Kumari, Subhasish Biswas and Sanjay Kumar. 2020. Effect of Green Coriander Leaves (*Coriandrum sativum*) and Sodium Bicarbonate on Deodorization of Goat Rumen Meat. *Int.J.Curr.Microbiol.App.Sci*. 9(03): 1182-1186.  
doi: <https://doi.org/10.20546/ijcmas.2020.903.138>