**Original Research Article**

**Study on sensory parameters by supplementation of Azolla meal and fish meal on chevon** **quality of Konkan Kanyal goat *(Please refine this title )***

***Option 1: Sensory evaluation of the quality of chevon from Konkan Kanyal goat supplemented with Azolla and fish meal***

***Option 2: Quality evaluation of chevon from Konkan Kanyal goat supplemented with Azolla meal and fish meal)***

**Aims**: Nutritional benefits of supplementation of Azolla meal and fish meal to Konkan Kanyal goat were exploited in the present study by feeding Azolla meal and fish meal through concentrate along with basal feed. This work aimed to facilitate supplementation of Azolla meal and fish meal not only increases nutritive value of chevon but also improved sensory quality. This study finds out optimum level of Azolla meal and fish meal in concentrate feed of Konkan Kanyal goat with two levels in Concentrate feed.

**Study design**: This research was experimental and performed in a field.

**Place and Duration of Study**: This study was conducted at Instructional Livestock farm, Department of Animal Husbandry and Dairy Science, College of agriculture, Dr. BSKKV, Dapoli, Maharashtra, India, during 2023-24

**Methodolgy:** The concentrate feed was prepared by supplementation of Azolla meal and fish meal with basal feed (Hybrid napier grass + Red gram straw + concentrate) with supplementation of 4 gm fish meal (A0F1), 8 gm fish meal (A0F2), 4 gm Azolla meal (A1F0), 4 gm Azolla meal and 4 gm fish meal (A1F1), 4 gm Azolla meal and 8 gm fish meal (A1F2), 8 gm Azolla meal (A2F0), 8 gm Azolla meal and 4 gm fish meal (A2F1) and 8 gm Azolla meal and 8 gm fish meal (A2F2) in concentrate, respectively and the experimental goats were slaughtered and the chevon of all treatment combinations were analyzed for sensory attributes i.e *;* tenderness, flavour, juiciness, appearance and overall acceptance of chevon by using 9-point Hedonic scale. Research Conducted with three Replications.

**Results:** Most optimum level of treatment combination of 4 gm Azolla meal and 8 gm fish meal (A1F2) supplementation through concentrate feed was found in obtaining maximum score for tenderness, flavour, juiciness, appearance and overall acceptance of chevon.

**Conclusion:** The study concludes that supplementing upto 4 gm Azolla meal and 8 gm fish meal (A1F2) through concentrate to experimental goats adds a nutritious boost to the chevon. The most acceptable quality of chevon can be obtained by supplementing 4 gm Azolla meal and 8 gm fish meal (A1F2) through concentrate to Konkan Kanyal goats.

 in Rasmalai can improve its sensory characteristics without compromising its

 *Keywords: Azolla meal, Fish meal, Chevon, Sensory, Konkan Kanyal*

1. INTRODUCTION

India basically is an agricultural country and livestock is the backbone of agriculture. Livestock sector has been playing an important role in Indian economy and is an important sub-sector of Indian agriculture (Taneja, 2014). The livestock population is 536.76 million in the country showing an increase of 4.8 % over livestock census 2012. The total livestock population in rural and urban area is 514.11 million and 22.65 million, respectively with percentage share of 95.78 % for rural and 4.22 % for urban area. In 20th livestock census, 36.04 % Cattle, 27.74 % Goats, 20.47 % Buffaloes, 13.83 % Sheeps, 1.69 % Pigs, population is recorded (Anonymous, 2019). Livestock accounts for 4.11 per cent of overall GDP and 25.6 per cent of agricultural GDP (20th Livestock Census). India is the world's second-largest goat producer with 148.88 million goats, an increase of 10.1 % from the previous livestock census in 2012 (Anonymous, 2019). Goats contributed 15.50 per cent share in total meat production in India (Anonymous, 2024). According to the 20th livestock census, Maharashtra has an overall goat population of 10.60 million with 38,161 in Ratnagiri district and 5116 in Dapoli Tehsil (Anonymous, 2019).

The Konkan Kanyal goat is registered breed and reared mostly by the Dhangar and Maratha communities for meat in Konkan region (Anonymous, 2013). Goats play an important role in the national economy and socio-economic development of small and marginal farmers by generating good income and employment. Goat rearing is an enterprise which has been practiced by a large population in rural areas.

The trend of incorporating feed supplements into goat diets has gained popularity due to several factors driven by economic, nutritional and sustainability considerations. Supplements such as mineral mixes, vitamins and protein-rich meals (e.g., soybean meal, fish meal) are common. These supplements help in improving the overall health of goats, boosting their immune system and enhancing reproductive efficiency. The use of supplements is particularly important in regions where natural forage is not nutritionally adequate or during dry seasons when forage availability is low with the rise of commercial goat farming in India and the potential for export, there is a greater emphasis on maintaining high standards of meat and milk quality. Feed supplements play a vital role in achieving these standards by ensuring consistent and optimal animal growth and product quality. Supplements can often be more cost-effective in the long term by improving feed conversion ratios. This efficiency is crucial for the profitability of goat farming. Now a days, using indigenous and alternative supplements like Azolla, a water fern also known as duck weed is genus of seven species of aquatic ferns belong to the family Salviniaceae which is high in proteins, vitamin and minerals. Azolla grows in waterways in dense patches which can look like a green carpet. Generally, it grows in stagnated water, streams, canals, ponds, etc. where water is present for longer period under sunlight or shade of tree and is widely distributed throughout India. (Masoodi and Khan, 2012). Azolla contains around 23-27 % crude protein and 10 % carbohydrates on dry weight basis (Cherryl et al. 2014 and Kathirvelan et al. 2015).

 Azolla meal and fish meal are rich sources of protein and essential nutrients that can contribute to a well-balanced diet for male goats. Fish meal is an excellent source of high-quality protein, typically ranging from 60 % to 72 % of its dry weight. Traditionally used as livestock feed supplement (IS: 4307 – 1983). This protein is highly digestible and includes a complete amino acid profile essential for animal growth and development. Studying the optimal levels of these ingredients in the diet can help to ensure that, the goats receive all the nutrients they need for growth, development and overall health. Utilizing alternative protein sources like Azolla meal and fish meal in goat diets can potentially reduce costs associated with feeding while maintaining nutritional quality. Researching the effectiveness of incorporating these ingredients can help goat farmers to make uniformed decisions about their feeding strategies. The diet of male goats directly impacts their health, growth rate and overall performance. By studying the effects of Azolla meal and fish meal in their diet, researchers can assess how these ingredients influence parameters such as weight gain, energy levels and overall health status of the goats. Incorporating alternative protein sources like Azolla meal can contribute to sustainable farming practices by reducing the reliance on conventional feed sources. Understanding the impact of these ingredients on male goat diets can help to promote sustainable agriculture practices within the livestock industry. Studying the incorporation of Azolla meal and fish meal in the diet of male goats becomes essential to ensure optimal nutrition, cost-effective feeding strategies, improved health and performance of the goats and the promotion of sustainable livestock farming practices.

Thus, keeping the foregoing in mind, the current study has been designed to ascertain the ideal level of Azolla meal and fish meal inclusion as a feed supplement to examine the effect on growth performance and chevon quality of Konkan Kanyal goat.

2. material and methods

**Location and period of study**

The present work was carried out at the Instructional Livestock Farm, Department of Animal Husbandry and Dairy Science, College of Agriculture, Dapoli (DR. BSKKV DAPOLI)- 415 712, Ratnagiri, Maharashtra, India during 2023- 2024.

**2.1 Material:**

Hot air oven, Muffle furnace, Desiccator, Kjeldahl unit, Distillation assembly, Titration unit, Hot plate, Soxhlet apparatus, Beaker, measuring cylinder, pipette, conical flasks, crucibles, Metal tongs, Kjeldahl flask, Lipless beakers, Funnels, Filter papers, Whatman’s papers, Feeders, Water buckets, Nylon rope, Ear tags, Broom, Chaff cutter, Weighing balance, Metabolic cages, Measuring tape and labels.

**2.2 Methodology**

**2.2.1. Preparation of Azolla meal and fish meal**

A growth trial of 90 days was conducted on Twenty-seven Konkan Kanyal goats divided in nine treatment combination groups of three goats in each to study the effect of feeding optimum level of Azolla meal and fish meal on growth performance and chevon quality of goats. Dried fish meal procured from market was again dried in the solar tunnel dryer for removal of moisture present in the fish meal (till DM 95 per cent). Fresh Azolla was grown at instructional dairy farm ponds. Fully grown Azolla was harvested and dried inside the solar tunnel dryer for making the Azolla meal.

**2.2.2. Feeding**

 All the experimental goats including control group (A0F0) were fed as per ICAR (2013) feeding standard to meet their nutritional requirement. The Azolla meal and fish meal were supplemented through concentrate to goats in treatment combinations *viz;* (A0F1) 4 gm fish meal, (A0F2) 8 gm fish meal, (A1F0) 4 gm Azolla meal, (A1F1) 4 gm Azolla meal and 4 gm fish meal, (A1F2) 4 gm Azolla meal and 8 gm fish meal, (A2F0) 8 gm Azolla meal, (A2F1) 8 gm Azolla meal and 4 gm fish meal and (A2F2) 8 gm Azolla meal 8 gm fish meal supplemented with concentrate per day up to the 90 days with seven days of metabolic trial for collection of urine and faeces samples of goats.

**2.2.3. Treatment details**

Number of treatment combinations: 9

No. of replications: 3

Total no. of animals: 27

**2.2.4. Experimental layout:**

Basal feed :- Red gram straw +Hybrid Napier grass +Concentrate mixture

F1 = 4 gm fish meal

A1 = 4 gm Azolla meal

F2 = 8 gm fish meal

A2 = 8 gm Azolla meal

**Treatment combinations:**

A0F0 - Basal feed (Control)

A0F1- Basal feed + 4 gm fish meal

A0F2- Basal feed + 8 gm fish meal

A1F0- Basal feed + 4 gm Azolla meal

A1F1- Basal feed + 4 gm Azolla meal + 4 gm fish meal

A1F2- Basal feed + 4 gm Azolla meal+ 8 gm fish meal

A2F0- Basal feed + 8 gm Azolla meal

A2F1- Basal feed + 8 gm Azolla meal + 4 gm fish meal

A2F2- Basal feed + 8 gm Azolla meal + 8 gm fish meal

**2.2.4.Replications**

The research was conducted with Three replications.

**2.2.5 Slaughter studies**

To study the chevon quality and quantity slaughter study were done after the completion of seven days digestion trial. The representative animals were slaughtered by ‘Halal’ method after overnight starving. The live weights before slaughter were recorded. Stripping, legging, dressing and evisceration were performed by adopting the standard procedures described by Gerrand (1964).

The weight of primal cuts (legs, loin, rack, breast and fore shank, neck and shoulder) and visceral organs (liver, kidney, heart, testicles, spleen, lungs with trachea, abdominal fat and gastro-intestinal tract) were recorded. The carcasses were divided into 5 cuts - leg, loin, rack, shoulder and neck and fore shank and brisket as suggested by the National Livestock and Meat Board of United States of America (Brandly et al., 1968).

**2.2.6. Sensory evaluation of chevon**

Ten potential panellists were selected from staff of the Department of Animal Husbandry and Dairy Science, Dr. BSKKV, Dapoli and other departments of the university. Panellists were selected on basis of the following criteria.

Not allergic to any foods, interested in and willing to test the sample meat products, enjoy working in a group and able to participate during training and testing. Some of these panellists had previous sensory training or descriptive analysis experience and had participated in the sensory assessment of chevon.

Pressure cooked meat (pooled representative sample from each diet) 1.0 % salt was subjected to sensory evaluation on modified nine points hedonic scale for appearance, flavour, juiciness, tenderness and overall acceptability was given in score card. The questionnaire consisted of nine points hedonic scale where the respondents were to respond to the question of how much do you like or dislike the sample? The following scale was used to categorize the respondents.

All meat samples (n = 12/treatment) were coded with randomized 3-digit codes and rotated to prevent bias. Meat samples were lightly-salted (1.0 % salt) the cooked breasts were cut into smaller cubes of 2.5 x 2.5 x 2.5 cm to serve to the respondents. Each sample was served in a bowl. Tasting of meat samples was performed at room temperature. Each respondent tasted the samples before completing the relevant questionnaire. Tap water at room temperature was provided for rinsing between samples during the taste sessions.

**FLOW DIAGRAM**

Sampling of meat pisces

Randomization with3-digit codes

Addition of 1.0 % salt

Cooking (72-80º C temp)

Cutting meat samples (2.5 X 2.5 X 2.5 cm cubes)

Served for taste

**Fig. 1: Flow chart for meat sample preparation**

**2.2.7. Statistical analysis**

For present investigation, FRBD i.e., Factorial Randomized Block design was employed using three replications.

3. results and discussion (*You may consider discussing the results. What you did were just a presentation of results. You may compare your results to the results of similar article. Look for more recent references if available.)*

The present investigation was undertaken to evaluate sensory quality of chevon by supplementation of different levels of Azolla meal and fish meal through concentrate fed to Konkan Kanyal goat. The results of present research work are average of 3rd -time replicated data tabulated, presented and discussed along with statistical analysis under following main heads.

Sensory evaluation of any consumable product is the best method of judging the acceptability of the product by the consumers. Sensory evaluation plays vital role in product development as well as in determining the shelf-life of a product. The sensory assessment was done by studying the parameters like appearance, flavour, juiciness, tenderness and overall acceptability of the product by the panel of judges by using “Nine Point Hedonic Scale” score card. The results of the study presented herein under in Table 1

|  |
| --- |
| **Table 1 :Effect of supplementation of Azolla meal and fish meal on sensory evaluation of chevon quality of experimental goats** |
| **Treatment****combination** | **Sensory parameter (Score out of 9)** |
| **Tenderness** | **Flavour** | **Juiciness** | **Appearance** | **Overall acceptance** |
| **Average score of three replication** |
| **A0F0** | 7.22 | 7.51 | 7.43 | 7.67 | 7.10 |
| **A0F1** | 8.32 | 8.32 | 7.53 | 7.98 | 8.18 |
| **A0F2** | 8.38 | 8.35 | 7.58 | 8.00 | 8.22 |
| **A1F0** | 7.27 | 7.59 | 7.48 | 7.86 | 7.95 |
| **A1F1** | 8.42 | 8.42 | 7.62 | 8.34 | 8.29 |
| **A1F2** | 8.58 | 8.50 | 7.65 | 8.38 | 8.31 |
| **A2F0** | 7.24 | 7.57 | 7.46 | 7.84 | 7.92 |
| **A2F1** | 8.27 | 8.18 | 7.51 | 7.88 | 8.12 |
| **A2F2** | 8.30 | 8.22 | 7.50 | 7.93 | 8.14 |
| **S.E.M (A)** | 0.01 | 0.01 | 0.01 | 0.11 | 0.02 |
| **S.E.M (F)** | 0.01 | 0.01 | 0.01 | 0.11 | 0.02 |
| **S.E.M (A x F)** | 0.02 | 0.02 | 0.01 | 0.19 | 0.03 |
| **C.D (A)** | 0.03 | 0.03 | 0.02 | 0.32 | 0.06 |
| **C.D (F)** | 0.03 | 0.03 | 0.02 | 0.32 | 0.06 |
| **C.D (A x F)** | 0.05 | 0.05 | 0.03 | 0.56 | 0.10 |
| **Result (Tr.SS)** | SIG | SIG | SIG | NONSIG | SIG |
| **Result (A)** | SIG | SIG | SIG | NONSIG | SIG |
| **Result (F)** | SIG | SIG | SIG | NONSIG | SIG |
| **Result (A x F)** | SIG | SIG | SIG | NONSIG | SIG |

**Note: A-Azolla Level F: Fish meal Level**

**Sensory evaluation of chevon**

Sensory evaluation was based score given by judges on score card *viz;* tenderness, flavour, juiciness, appearance and overall acceptance of chevon of treatment combinations for A0F0, A0F2, A0F1, A1F0, A1F1, A1F2, A2F0, A2F1 and A2F2 were recorded as 7.22, 8.32, 8.38, 7.27, 8.42, 8.58, 7.24, 8.27 and 8.30 ; 7.51, 8.32, 7.59, 8.42, 8.50, 7.57, 8.18, and 8.22 ; 7.43, 7.53, 7.58, 7.48, 7.62, 7.65, 7.46, 7.51 and 7.50; 7.67, 7.98, 8.00, 7.86, 8.34, 8.38, 7.84, 7.88 and 7.93; 7.10, 8.18, 8.22, 7.95, 8.29, 8.31, 7.92, 8.12 and 8.14, respectively.

Statistical perusal of the data showed that, results with respect to tenderness, flavour, juiciness and overall acceptance of chevon of treatment combinations are statistically significant for both the factors under study i.e. fish meal and Azolla meal at (P<0.05) level of significance. Similarly, interaction effect between two factors under the study is statistically significant. whereas appearance of chevon parameter is found statistically non-significant for both the factors and for interaction effect for between two factors under the study were statistically non-significant.

**3.1Tenderness**

The data presented in Table 1 showed that the score for tenderness was increased due to supplementation of fish meal through concentrate to experimental goats. The highest score for tenderness of chevonwas observed for treatment combination A1F2 (8.58) i.e.4 gm Azolla meal and 8 gm fish meal followed by treatment A1F1 (8.42) i.e. 4 gm Azolla meal and 4 gm fish meal, A0F2 (8.38), A0F1 (8.32), A2F2 (8.30), A2F1 (8.27). The lowest score for tenderness of chevonwas observed for treatment combinations A1F0 (7.27) and A2F0 (7.24).

The statistical interpretation of data reveals that effect of Azolla meal as well as interaction effect of Azolla meal and fish meal were significant at both the levels of probability. However, effect of Azolla meal was significant at 5% level of probability. The statistical interpretation of data indicates that for different levels of Azolla meal treatment combinations were statistically different from other treatment combinations whereas statistical interpretation of data reveals that effect of fish meal as well as interaction effect of Azolla meal and fish meal were significant at both the levels of probability. However, effect of fish meal was significant at 5% level of probability. The statistical interpretation of data indicates that for different levels of fish meal treatment combinations were statistically different from other treatment combinations. In the present investigation treatment combinations of Azolla meal and fish meal were used to prepare supplemented concentrate feed with two levels *viz.,* 4 gm Azolla meal and 8 gm Fish meal. It has been found that at both the levels of 4 gm Azolla meal and 8 gm fish meal feeding to the experimental goats obtained the most optimum results regarding chevon quality.

**3.2 Flavour**

The data presented in Table 1 showed that the score for flavour was increased due to supplementation of fish meal through concentrate to experimental goats. The highest score for tenderness of chevonwas observed for treatment combination A1F2 (8.50) i.e.4 gm Azolla meal and 8 gm fish meal followed by treatment A1F1 (8.42) i.e. 4 gm Azolla meal and 4 gm fish meal, A0F2 (8.35), A0F1 (8.32), A2F2 (8.22), A2F1 (8.18). The lowest score for flavour of chevon was observed for treatment combinations A1F0 (7.59) and A2F0 (7.57).

The statistical interpretation of data reveals that effect of Azolla meal as well as interaction effect of Azolla meal and fish meal were significant at both the levels of probability. However, effect of Azolla meal was significant at 5% level of probability. The statistical interpretation of data indicates that for different levels of Azolla meal treatment combinations were statistically different from other treatment combinations whereas statistical interpretation of data reveals that effect of fish meal as well as interaction effect of Azolla meal and fish meal were significant at both the levels of probability. However, effect of fish meal was significant at 5% level of probability. The statistical interpretation of data indicates that for different levels of fish meal treatment combinations were statistically different from other treatment combinations. In the present investigation treatment combinations of Azolla meal and fish meal were used to prepare supplemented concentrate feed with two levels *viz.,* 4 gm Azolla meal and 8 gm Fish meal. It has been found that at both the levels of 4 gm Azolla meal and 8 gm fish meal feeding to the experimental goats obtained the most optimum results regarding flavour of chevon.

**3.3 Juiciness**

The data presented in Table 1 showed that the score for juiciness was increased due to supplementation of fish meal through concentrate to experimental goats. The highest score for juiciness of chevonwas observed for treatment combination A1F2 (7.65) i.e.4 gm Azolla meal and 8 gm fish meal followed by treatment A1F1 (7.62) i.e. 4 gm Azolla meal and 4 gm fish meal, A0F2 (7.58), A0F1 (7.53), A2F2 (8.51), A2F1 (8.50). The lowest score for flavour of chevon was observed for treatment combinations A1F0 (7.48) and A2F0 (7.46).

The statistical interpretation of data reveals that effect of Azolla meal as well as interaction effect of Azolla meal and fish meal were significant at both the levels of probability. However, effect of Azolla meal was significant at 5% level of probability. The statistical interpretation of data indicates that for different levels of Azolla meal treatment combinations were statistically different from other treatment combinations whereas statistical interpretation of data reveals that effect of fish meal as well as interaction effect of Azolla meal and fish meal were significant at both the levels of probability. However, effect of fish meal was significant at 5% level of probability. The statistical interpretation of data indicates that for different levels of fish meal treatment combinations were statistically different from other treatment combinations. In the present investigation treatment combinations of Azolla meal and fish meal were used to prepare supplemented concentrate feed with two levels *viz.,* 4 gm Azolla meal and 8 gm Fish meal. It has been found that at both the levels of 4 gm Azolla meal and 8 gm fish meal feeding to the experimental goats obtained the most optimum results regarding juiciness of chevon.

**3.4 Appearance**

The data presented in Table 1 showed that the score for appearance was increased due to supplementation of fish meal through concentrate to experimental goats. The highest score for appearance of chevonwas observed for treatment combination A1F2 (8.38) i.e.4 gm Azolla meal and 8 gm fish meal followed by treatment A1F1 (8.34) i.e. 4 gm Azolla meal and 4 gm fish meal, A0F2 (8.00), A0F1 (7.98), A2F2 (7.93), A2F1 (7.88). The lowest score for flavour of chevon was observed for treatment combinations A1F0 (7.86) and A2F0 (7.84).

The statistical interpretation of data reveals that effect of Azolla meal as well as interaction effect of Azolla meal and fish meal were non-significant at both the levels of probability. However, effect of Azolla meal was non-significant at 5% level of probability. The statistical interpretation of data indicates that for different levels of Azolla meal treatment combinations were statistically non-significant from other treatment combinations whereas statistical interpretation of data reveals that effect of fish meal as well as interaction effect of Azolla meal and fish meal were non-significant at both the levels of probability. However, effect of fish meal was non-significant at 5% level of probability. The statistical interpretation of data indicates that for different levels of fish meal treatment combinations were statistically non-significant than other treatment combinations. In the present investigation treatment combinations of Azolla meal and fish meal were used to prepare supplemented concentrate feed with two levels *viz.,* 4 gm Azolla meal and 8 gm Fish meal. It has been found that at both the levels of 4 gm Azolla meal and 8 gm fish meal feeding to the experimental goats obtained the average results regarding appearance of chevon.

**3.5 Overall acceptance**

The data presented in Table 1 showed that the score for overall acceptance was increased due to supplementation of fish meal through concentrate to experimental goats. The highest score for overall acceptance of chevonwas observed for treatment combination A1F2 (8.31) i.e.4 gm Azolla meal and 8 gm fish meal followed by treatment A1F1 (8.29) i.e. 4 gm Azolla meal and 4 gm fish meal, A0F2 (8.22), A0F1 (8.18), A2F2 (8.14), A2F1 (8.12). The lowest score for flavour of chevon was observed for treatment combinations A1F0 (7.95) and A2F0 (7.92).

The statistical interpretation of data reveals that effect of Azolla meal as well as interaction effect of Azolla meal and fish meal were significant at both the levels of probability. However, effect of Azolla meal was significant at 5% level of probability. The statistical interpretation of data indicates that for different levels of Azolla meal treatment combinations were statistically significant from other treatment combinations whereas statistical interpretation of data reveals that effect of fish meal as well as interaction effect of Azolla meal and fish meal were significant at both the levels of probability. However, effect of fish meal was significant at 5% level of probability. The statistical interpretation of data indicates that for different levels of fish meal treatment combinations were statistically significant than other treatment combinations. In the present investigation treatment combinations of Azolla meal and fish meal were used to prepare supplemented concentrate feed with two levels *viz.,* 4 gm Azolla meal and 8 gm Fish meal. It has been found that at both the levels of 4 gm Azolla meal and 8 gm fish meal feeding to the experimental goats obtained the average results regarding overall acceptance of chevon.

In the present result, treatment combination A1F2 (8.31) showed significantly highest overall acceptance and treatment group T1 (7.10) showed comparatively lowest acceptance to other treatment combinations. The present results are correlated with the physical properties of chevon with respect of pH, water holding capacity, cooking loss and tenderness and the results recorded by Adiwinarti et al. (2016) studied the improving performance of local Kacang goats using ruminally undegradable protein feeds and reported the highest values for pH, water holding capacity, cooking loss and tenderness as 6.08, 38.40, 38.56 94 per cent and 6.94 (kg cm2), respectively by feeding fish meal to local Kacang goats.

**4. CONCLUSION**

 The study concludes that supplementation of 4 gm Azolla meal and 8 gm fish meal through concentrate feed to Konkan Kanyal goats can improve its sensory parameters of chevon without compromising its traditional appeal, offering a nutritious twist to the chevon. Most acceptable quality chevon can be obtained from Konkan Kanyal goats by supplementing the levels of Azolla meal and fish meal through concentrate feeding.

**DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

Author(s) hereby declares that No generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

5. References

Adiwinarti, R. Kustantinah, I. Budisatria, G. S. Rusman and Indarto, E. 2016. Improving the performance of local Kacang goats using ruminally undegraded protein feeds. Asian J. Anim. Sci. (10) : 262-267.

Anonymous, 2013. Konkan Kanyal Goat Breed. Retrieved from www.icar.org.in/files/reports/ icar-dare-annual-reports/2010-11 on the 26/04/2014.

Anonymous, 2019. 20th Livestock census. All India Report, Ministry of Agriculture. Department of Animal Husbandry, Dairying and Fisheries, Government of India.

Anonymous, 2024. Basic Animal Husbandry Statistics, GOI, Ministry of Fisheries, Animal husbandry and dairying, Dept. of Animal husbandry and dairying.

Brandly, P. J. George, M. Tyalor. and Kenneth, E. 1968. Meat Hygiene, 3rd Edn, Lea and Febiger, Philadelphia, USA.

Cherryl, D. M. Prasad, R. M. V. Jagdeswarao, S. Jaylaxmi, P. and Kumar, S. D. 2014. A study on nutritive value of *Azolla pinnata*. Livestock res. Int. (1):13-15.

Gerrand, F. 1964. In: Meat Tech. 3rd Edn. Leonard hell Ltd. London.

IS: 4307-1983. Specification for fish meal as livestock feed ingredient, Second revision, Indian Standard Institution, Manak Bhavan, New Delhi, India.

Kathirvelan, C. Banupriya, S. and Purushottam, M. R. 2015. Azolla an alternate and sustainable feed for livestock. Int. J. Sci. Envi. and Tech. 4 (4):1153-1157.

Masoodi, A. and Khan, F. A. 2012. A new record to the invasive Alien flora of India: *Azolla cristata.* National academy Science letters. 35: 493-495.

Taneja, V. K. 2014. Vision 2030. Guru Angad Dev. Vet. and Animal Science University, Ludhiana (Punjab), India.