

# International Journal of Statistics and Applied Mathematics

ISSN: 2456-1452  
Maths 2024; SP-9(1): 198-200  
© 2024 Stats & Maths  
<https://www.mathsjournal.com>  
Received: 13-12-2023  
Accepted: 15-01-2024

**Dr. S Ilavarasan**  
PhD scholar, Division of  
Pharmacology and Toxicology  
IVRI Bareilly, Uttar Pradesh,  
India

**T Lurthu Reetha**  
Professor and Head, RREC  
TANUVAS, Pudukkottai, Tamil  
Nadu, India

**Dr. P Mekala**  
Associate Professor and Head,  
Department of Veterinary  
Pharmacology and Toxicology  
VCRI Udumalpet, Tamil Nadu,  
India

**A Sheeba**  
Assistant Professor, TANUVAS,  
Pudukkottai, Tamil Nadu, India

**Sathya J**  
PG Scholar, Alagappa  
University, Karaikudi, Tamil  
Nadu, India

**Corresponding Author:**  
**Dr. S Ilavarasan**  
PhD scholar, Division of  
Pharmacology and Toxicology  
IVRI Bareilly, Uttar Pradesh,  
India

## Effect of dietary inclusion of seaweed (*Ulva lactuca*) on growth performance of TANUVAS-Aseel Chicken

S Ilavarasan, T Lurthu Reetha, Dr. P Mekala, A Sheeba and Sathya J

### Abstract

A study was conducted to evaluate the effect of dietary seaweed (*Ulva lactuca*) on growth performance of TANUVAS- Aseel chicken maintained at TANUVAS- Regional Research and Educational Centre, Pudukkottai. Seaweed (*Ulva lactuca*) is considered to be a good source of nutrition. It contains high amounts of cobalamin or Vitamin B12. In this study, a total of 90 chicks were selected and they were allocated into three groups, C1( Control), T<sub>1</sub> (*Ulva lactuca*-1.5%), T<sub>2</sub> (*Ulva lactuca*-3%). Birds were fed with ad libitum feed and water and the study was started at fourth week onwards. The parameters such as body weight at 8<sup>th</sup> and 12<sup>th</sup> week, livability were recorded. Mean body weight for C1 group -1.05±0.01, T<sub>1</sub>- 1.10±0.01 and T<sub>2</sub> group 1.124±0.012. Body weight and livability of TANUVAS- Aseel Chicken showed better performance compared to control groups. Hence, it was concluded that supplementation of *Ulva lactuca* is beneficial in terms of growth performance in TANUVAS-Aseel Chicken compared to control groups.

**Keywords:** Seaweed (*Ulva lactuca*), Growth performance, TANUVAS- Aseel

### Introduction

The green macroalga *Ulva lactuca*, also referred to as sea lettuce, is a member of the *Ulvaceae* family. It is widespread around the world in brackish and marine habitats, especially along the coast. Since *Ulva lactuca* resembles lettuce leaves in appearance and has a distinctive leaf-like structure, this is how it got its popular name. Green macroalgae, particularly those of the genus *Ulva*, grow quickly and accumulate biomass quickly, which has increased their production globally [1]. At a level of 1-5% inclusion, seaweeds have been utilized in poultry to boost immunological function, reduce microbial burden in the digestive tract, and increase the quality of poultry meat and eggs [2].

Seaweeds gather more attention due to higher content of essential amino acids, minerals, vitamins and trace metals Makkar *et al.* [3] stated that the *Ulva* sp. contained 18.6% crude protein, 6.9% crude fibre, 26.2% neutral detergent fibre, 8.7% acid detergent fibre, 3.5% lignin, 1.2% ether extract, 23% ash and 14.7 MJ/kg gross energy on dry matter basis.

Zahid Phool *et al.* [4] reported that supplements of seaweed enhance the nutritive quality and growth of small animals and birds in terms of body weight gain, fats and protein contents. Okab [5] stated seaweeds can be used as an alternative source of feed for animals. Seaweed was also a richest source of antioxidants which enhances the immune status. The digestibility studies on seaweeds, particularly *U. lactuca*, as a feed supplement to animals were scarce [6]. Seaweed usage appeared to be economically, ecologically, sociologically and etiologically viable. More studies are needed to evaluate the effects of feeding a diet supplemented with various combinations of seaweeds.

TANUVAS Aseel is a superior variety of native chicken developed by Poultry Research Station, TANUVAS using strains of Aseel from Central Poultry Development Organization (CPDO), Bhubaneswar (Base population), Directorate of Poultry Research (DPR), Hyderabad and from a private entrepreneur and champion breeders. All the birds were brought into the genetic pool and random breeding was carried out. Later on, individual selection was carried out in the male for higher body weight and family selection was done in female for more egg number (part time egg production). Accordingly, a dual-purpose native variety of Aseel with all the characteristic features of the breed was evolved for table purpose with continuous

selection and breeding for six generations, which is maintained at Poultry Research Station, Tamil Nadu Veterinary and Animal Sciences University, Chennai. This dual-purpose bird is well received by farming community because of its better growth rate and egg production capability [7].

### Benefits of *Ulva lactuca*

**1. Nutritional Composition:** *Ulva lactuca* is rich in essential nutrients, including proteins, amino acids, vitamins, minerals, and carbohydrates. The specific nutritional composition can vary based on factors such as season, location, and growth conditions. However, in general, *Ulva lactuca* contains a high proportion of protein, which is an essential component for growth and development in poultry. It also provides a range of vitamins, including vitamin A, vitamin C, and vitamin E, which play important roles in various physiological functions.

**2. Antibacterial Properties:** *Ulva lactuca* has been found to possess antimicrobial properties. Several studies have shown that extracts from *Ulva lactuca* exhibit inhibitory effects against various pathogenic bacteria, including *Salmonella* and *Escherichia coli*. By including *Ulva lactuca* in poultry feed, it is believed that the antimicrobial compounds present in the seaweed can help reduce the growth of harmful bacteria in the gut, thereby promoting gut health and potentially improving overall bird health.

**3. Antioxidant Activity:** *Ulva lactuca* contains antioxidants such as phenolic compounds, flavonoids, and vitamins, which have been shown to scavenge free radicals and protect cells from oxidative damage. Oxidative stress can negatively impact the health and performance of poultry. Including *Ulva lactuca* in the feed may contribute to the antioxidant status of the birds, potentially reducing oxidative stress and improving overall health.

**4. Immunomodulatory Effects:** Some studies have suggested that *Ulva lactuca* possesses immunomodulatory properties. It may enhance the immune response in poultry by stimulating the production of immune-related cells and molecules. This can be particularly beneficial in improving disease resistance and overall health in poultry.

**5. Fibrous Material and Gut Health:** *Ulva lactuca* contains dietary fiber, including both soluble and insoluble fibers. Including fiber-rich ingredients in poultry feed can promote gut health by improving the composition of the gut microbiota and supporting the development of a healthy gastrointestinal tract. The fiber content of *Ulva lactuca* can contribute to the overall fiber intake of the birds.

### Methods

#### *Ulva lactuca*

About 20 kg of seaweed *U. lactuca* was collected from Mandapam and Therkutharavai coastal area of Ramanathapuram District. The *U. lactuca* was collected, rinsed five times in freshwater to remove salts, and then dried in the shade. In a unique *p Ulva* riser, the dried seaweed was ground into a fine powder.

#### Feed

The grower mash mixed with (1.5% *U. lactuca*) was used in T<sub>1</sub> group, the mash mixed with 3.0% of green seaweed was used in T<sub>2</sub> group and the plain grower mash without the addition of any supplements was used in control (C1) group.

#### Chicks

A total of 90 numbers of 4 weeks old Aseel chicken were used for this study. They were randomly distributed into two dietary treatment groups and one control group. Each bird was taken as an experimental unit and the number of replicates per group was 30.

#### Experimental site

The experiment was conducted to evaluate the effect of dietary seaweed (*Ulva lactuca*) on growth performance of TANUVAS-Aseel chicken maintained at TANUVAS-Regional Research and Educational Centre, Pudukkottai. The parameters such as body weight at 8<sup>th</sup> and 12<sup>th</sup> week, livability were recorded.

#### Proximate analysis

Proximate analysis of formulated and mixed ration, *U. lactuca* was done at AFAQAL, Namakkal, a constituent unit of TANUVAS, Chennai, to estimate the dry matter, moisture, crude protein, crude fibre, ether extract, total ash, acid insoluble ash, calcium, phosphorus and gross energy content as per standards of Association of Official Agricultural Chemists (AOAC) [8].

**Table 1:** Chemical composition of green algae (*Ulva lactuca*)

Chemical composition	(%)
Dry matter (%)	82.56
Moisture (%)	17.44
Crude protein (%)	16.55
Crude fibre (%)	4.93
Ether extract (%)	0.97
Total ash (%)	20.83
Calcium (%)	0.90
Phosphorus (%)	0.37
Metabolizable energy (Kcal/kg)	215

**Table 2:** Mean body weight of TANUVAS Aseel by supplementing *U. lactuca*

Sl. No.	Parameters	Control	Treatment-1 (1.5% <i>U. lactuca</i> )	Treatment-2 (3% <i>U. lactuca</i> )
1	Hatch weight in gms	35.10±0.52	35.42±0.46	35.02±0.37
2	Body weight at 4 <sup>th</sup> week in gms	280.93±5.02	279.25±5.18	280.75±5.81
3	Body weight at 8 <sup>th</sup> week in gms	571.00±15.74	608.75±13.64	631.15±11.05
4	Body weight at 12 <sup>th</sup> week in kgs	1.05±0.01	1.10±0.01	1.124±0.02

### Results and Discussions

Table 2. shows the impact of experimental diets on growth performance. Chicks fed with 1.5% and 3% *Ulva lactuca* mixed with normal feed showed better performance of body weight compared to control groups. After completion of eight weeks of study period body weight of treatment groups

increased compared to control groups. (Abid ali *et al.*) The BW at 8<sup>th</sup> week of age is increased by 9.98% in chicks ingesting the (3% *U. lactuca*) diet in comparison with the control whereas increased by 6.27% in 1.5% *U. lactuca*. The final BW at 12<sup>th</sup> week of age is increased by 11.17% in chicks ingesting the (3% *U. lactuca*) diet in comparison with the

control whereas increased by 9.92% in 1.5% *U. lactuca*. The incorporation of 1.5% and 3% *U. lactuca* in aseel chicks diet did not significantly affect chicken growth performance, Mean body weight of 12<sup>th</sup> week by supplementary dietary inclusion of *Ulva lactuca* is increased which is accordance with study of Vijayalingam *et al.* However, few studies evaluated the effect of dietary *Ulva* sp. on chicken growth when incorporated at levels higher than 10% feed [9], which is due to the fact that 20 and 30% of seaweed were reported to reduce ADG and increase FCR in broilers

### Conclusion

The incorporation of lower levels (1.5% and 3% feed) of seaweed in the TANUVAS aseel diet could represent a promising strategy to increase the body weight whereas higher level inclusion of *Ulva lactuca* may affect the bodyweight. It was concluded that supplementation of *Ulva lactuca* in lower level is beneficial in terms of growth performance in TANUVAS- Aseel Chicken compared to control groups

### References

1. Liu D, Keesing JK, He P, Wang Z, Shi Y, Wang Y. The world's largest macroalgal bloom in the Yellow Sea, China: Formation and implications. *Estuar. Coast. Shelf Sci.* 2013;129:2-10.
2. Canedo-Castro B, Pinon-Gimate A, Carillo S, Ramos D, Casas-Valdez M. Prebiotic effect of *Ulva rigida* meal on the intestinal integrity and serum cholesterol and triglyceride content in broilers, 2019.
3. Makkar HPS, Tran G, Heuzé V, Giger-Reverdin S, Lessire M, Lebas F, *et al.* Seaweeds for livestock diets: A review. *Anim. Sci. Technol.* 2015;212:1-17.
4. Zahid Phool B, Aisha K, Abid A. Green seaweed as component for poultry feed. *Bang J Bot.* 1995;24:153-157.
5. Okab AB. Risk and beneficial uses of sea algae (*Ulva lactuca* Linnaeus) in animal feedstuffs. In: Proceedings of the 7<sup>th</sup> international conference on risk factors of food chain. Faculty of Biotechnology and Food Sciences, Slovak University of Agriculture, Nitra; c2007. p. 152-158
6. Arieli A, Sklan D, Kissil G. A note on the nutritive value of seaweed to ruminants. *Anim Prod.* 1993;57:329-331.
7. Vinothraj S, Alagesan P, Pachiappan P, Saravanakumar S, Siva M, Srinivasan RD. Production Performance of TANUVAS Aseel Poultry Breed in Western Zone of Tamil Nadu, India. *Int. J Curr. Microbiol. App. Sci.* 2020;9(09):2447-2450.
8. NBAGR, National Bureau of Animal Genetic Resources, Karnal, Haryana; c2013 November 30<sup>th</sup>.