



75th EAAP Annual Meeting
1 - 5 September 2024, Florence

Effect of dietary supplementation of *A. nodosum* and *L. calcareum* combination on piglets' health

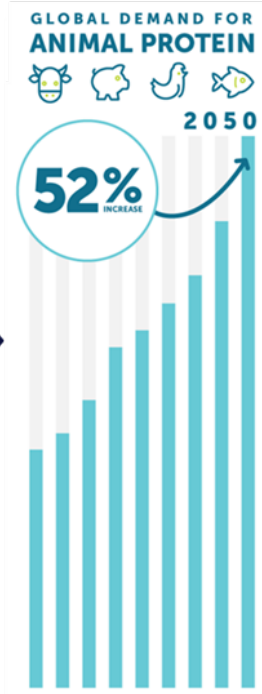
Frazzini Sara¹, Dell'Anno Matteo¹, Reggi Serena¹, Ferri Irene¹, Rossi Luciana¹

¹ Dept. of Veterinary Medicine and Animal Sciences (DIVAS), University of Milan

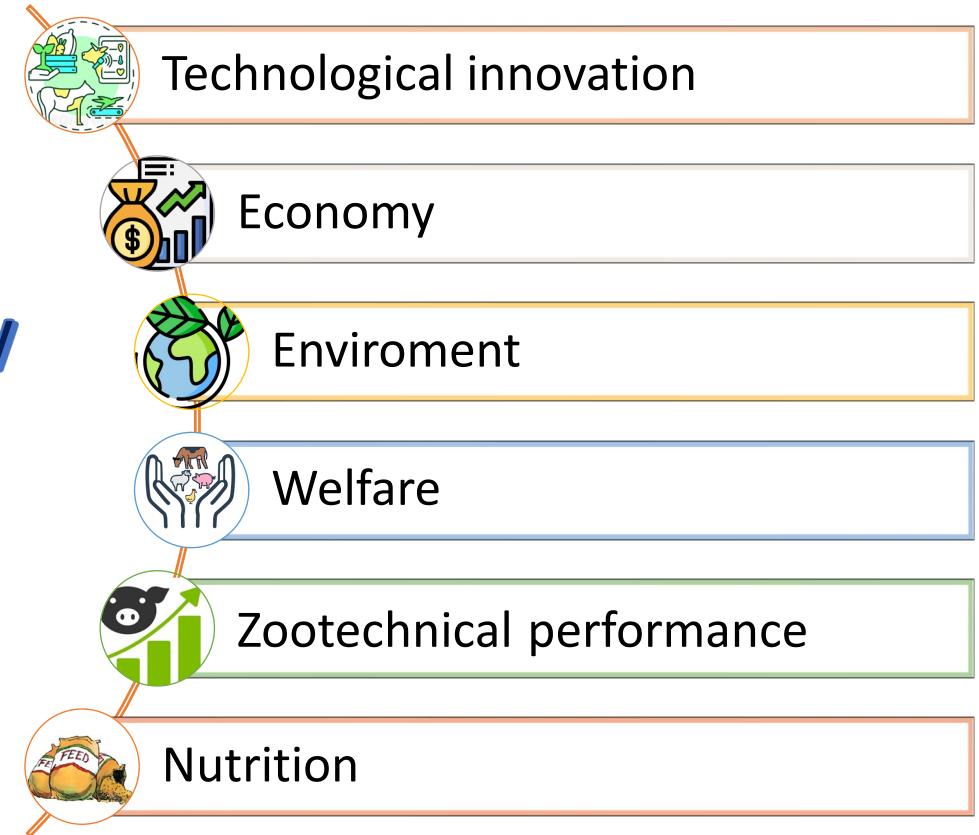
Background



(OECD-FAO 2021; FAO, 2019)



Sustainability of livestock production



NEED to find **ALTERNATIVE INGREDIENTS** to be used in animal nutrition to promote health and antibiotic reduction

Algae

Plant-like organisms with several advantages

(Gupta et al., 2011)

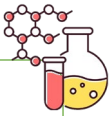
No competition
with arable land



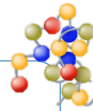
O₂ producers and
CO₂ consumers



Functional
compounds



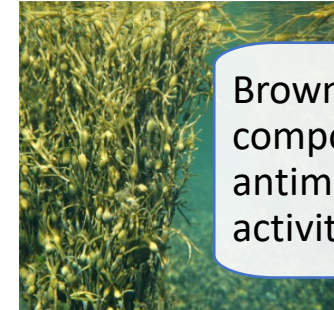
Nutritional value



Employed in various fields including
animal nutrition

(Reg EU 1017/2017)

Ascophyllum nodosum



Brown alga rich in bioactive
compounds, with recognized
antimicrobial and antioxidant
activities

(Frazzini et al., 2022)

Lithothamnium calcareum



Red alga, high concentration of
minerals.

(Almeida et al. 2012)

Previous our studies have demonstrated the
synergistic effect of this two algae

(Frazzini et al., 2024; Frazzini et al., 2022)

Aim



This study aimed to assess the effect of the inclusion in the diet of the combination of *Ascophyllum nodosum* and *Lithothamnium calcareum* on piglets' health.



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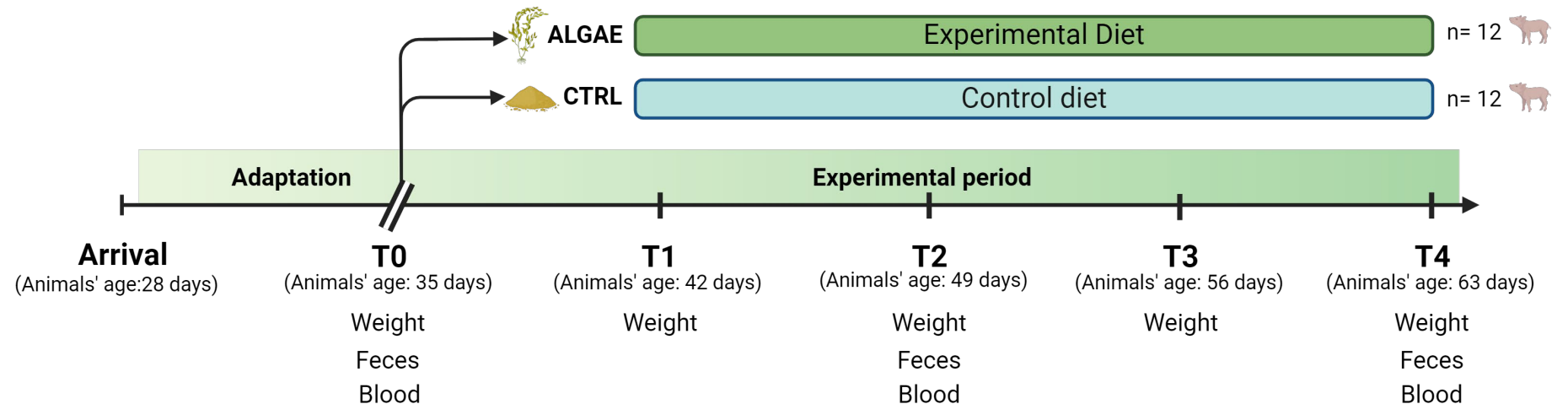
Materials and Methods

Experimental design

24 weaned piglets (28±2 days) divided in 2 experimental groups (1 animal/pen; 12 pen/group) balanced per weight and sex.

CTRL: basal diet
(PG: 17,19%; EM:3,28 Mc/Kg)

ALGAE: basal diet supplemented with 2% of algae mixture (1.5% of *A. nodosum* and 0.5% of *L. calcareum*)
(PG: 17,19%; EM:3,28 Mc/Kg)



Ethical authorization from Ministry of Health n° 884/2021-PR

Zootechnical performances

Body Weight (BW)

Average Daily Gain (ADG)

Average Daily Feed Intake (ADFI)

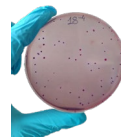
Feed Conversion Rate (FCR)

Biological samples analysis

Fecal sample



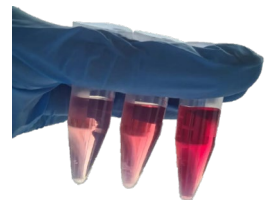
- Nitrogen content using Kjeldahl method
(AOAC, 2019)
- Apparent protein digestibility by AIA method
(Czech et al., 2021)
- Abundance of total, lactic acid and coliform bacteria through plate counting
(Rossi et al., 2021)



Blood

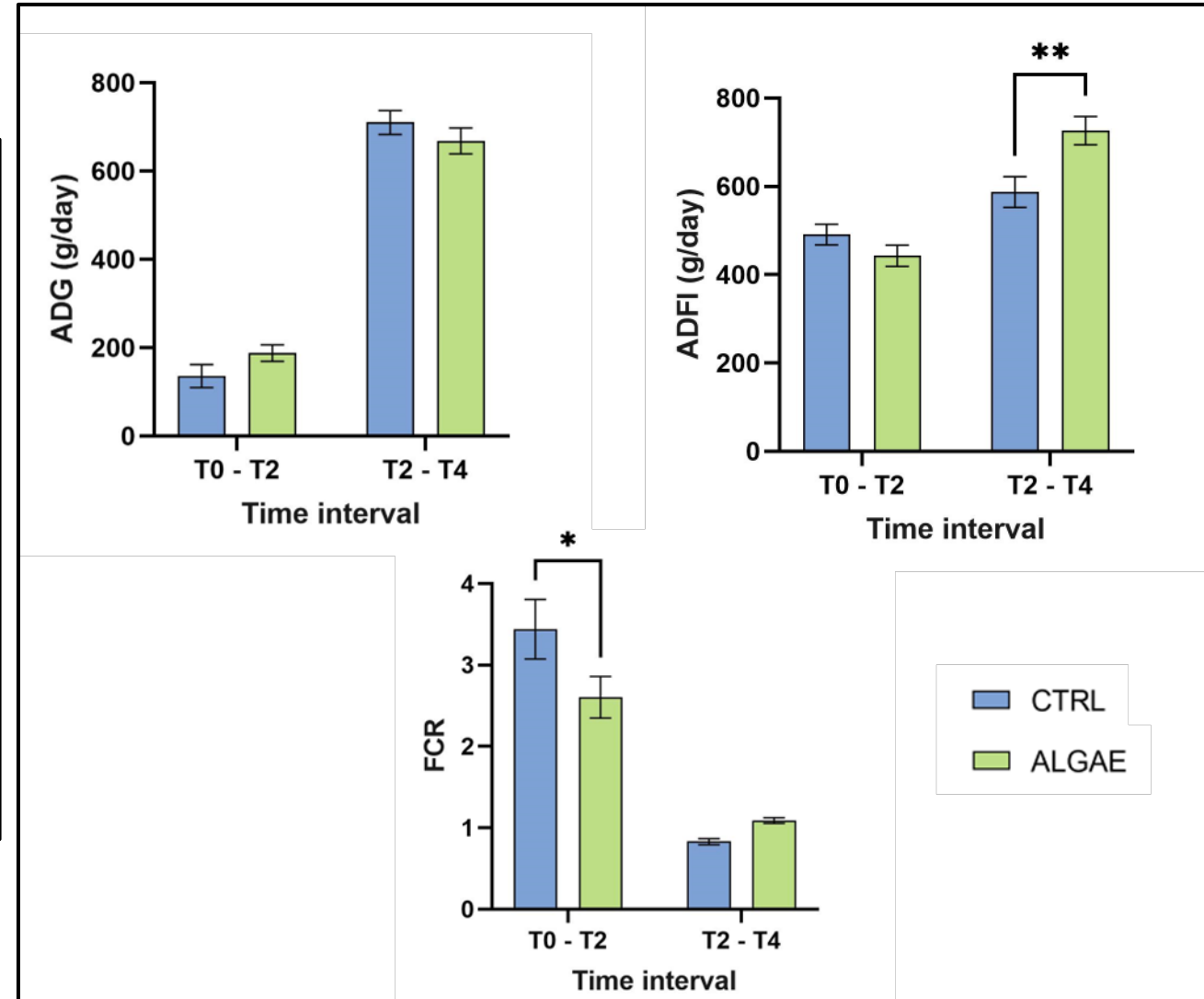
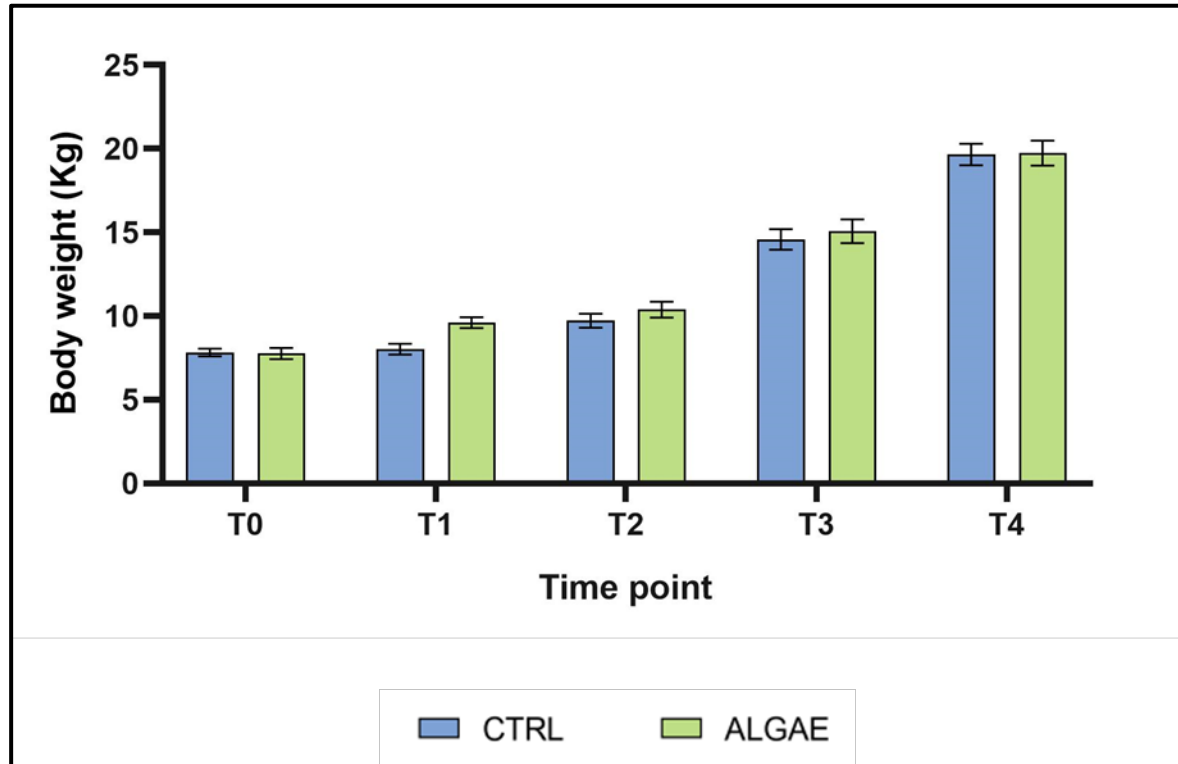


- Serum antioxidant barrier assessment with colorimetric assay (Oxy-Adsorbent Test)
(Wilson et al., 2023)



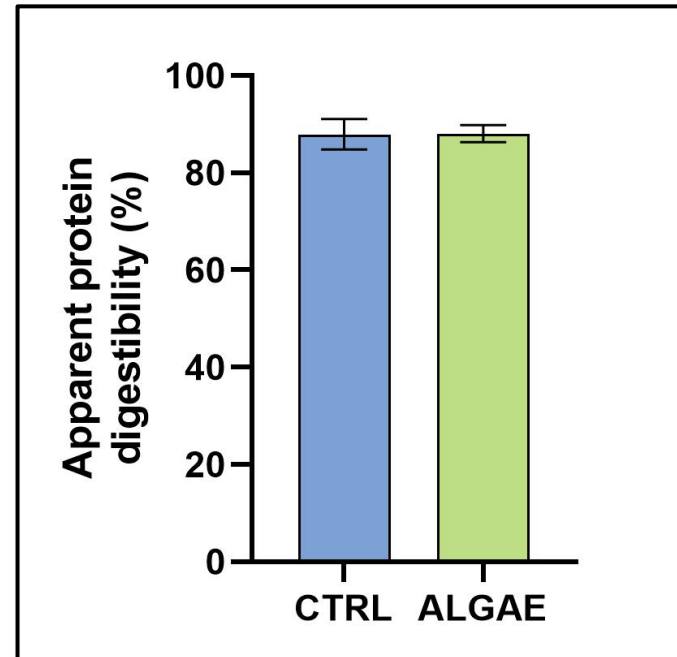
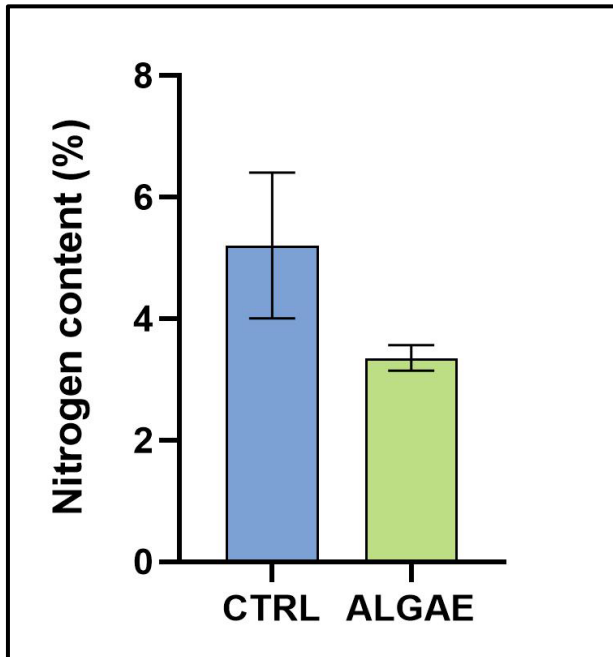
Results

Zootechnical performances



Results

Nitrogen Content and Apparent protein Digestibility of fecal sample

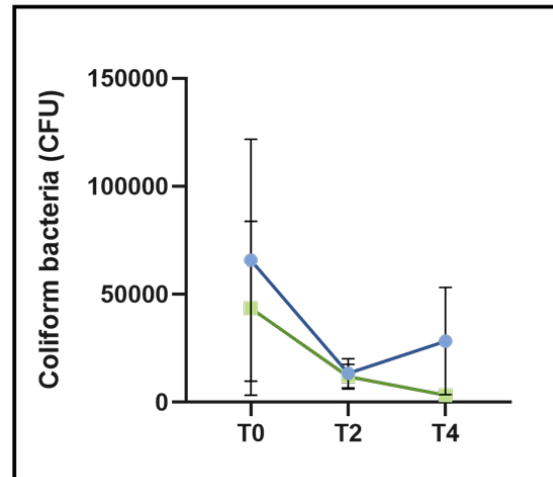
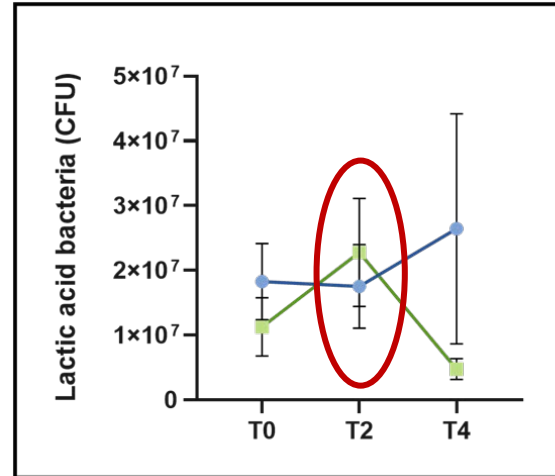
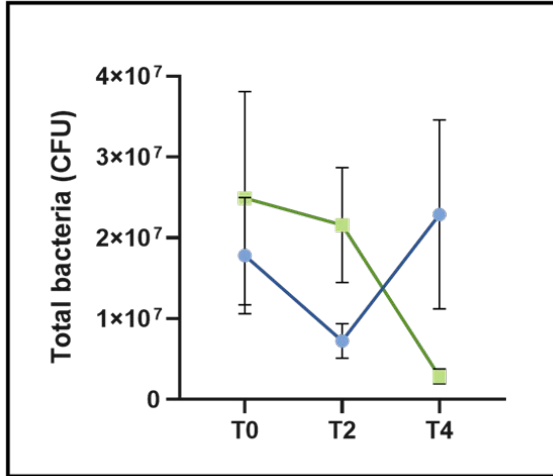


The nitrogen content of fecal sample revealed no significant differences between the experimental group compared to the CTRL group at T4.

These results were also reflected in the evaluation of the **apparent protein digestibility** that, as well as revealed no statistical difference between the CTRL and the ALGAE groups at T4

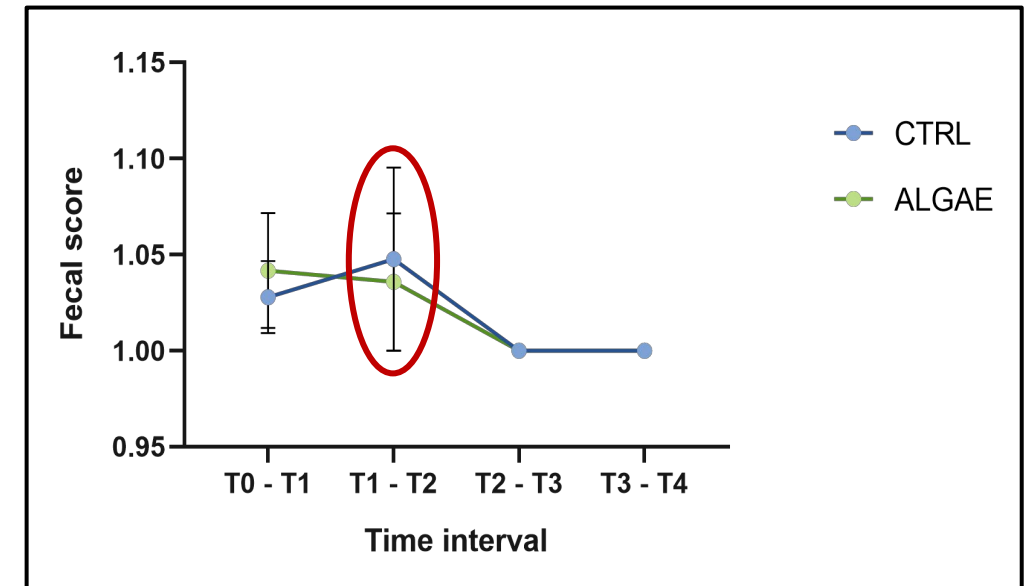
Results

Microbiological evaluation of feces



● CTRL
■ ALGAE

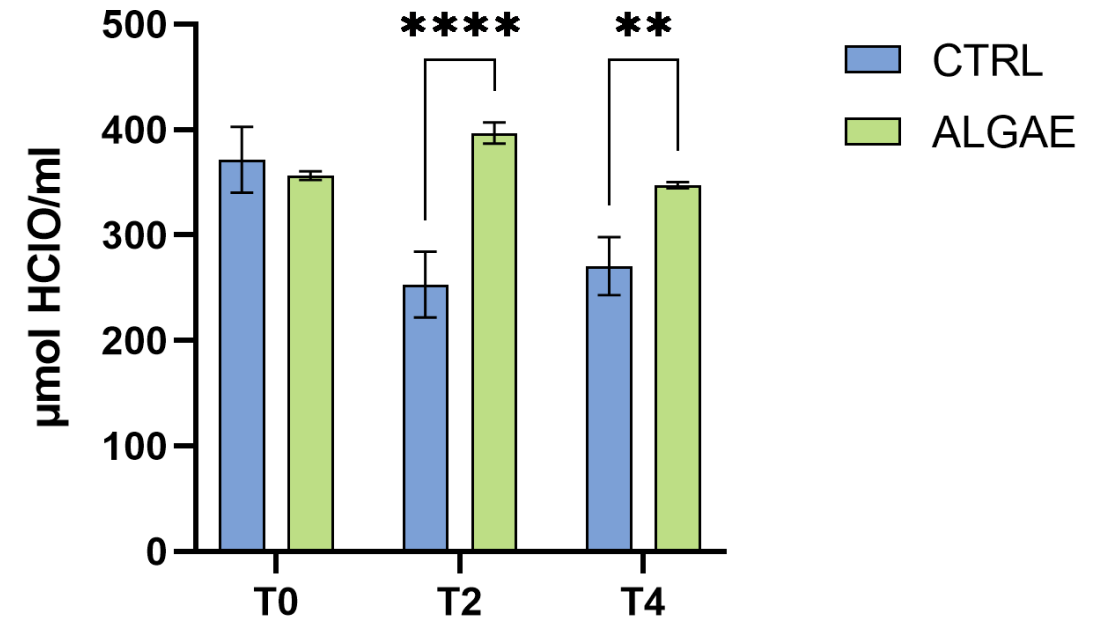
Fecal score



Results

Serum antioxidant barrier

Algae fed piglets showed a significantly higher antioxidant barrier at T2 and T4 compared to animals that received only the basal diet



Conclusions

Dietary supplementation of 2% of algal mixture (1.5% of *A. nodosum* and 0.5% of *L. calcareum*):

No alteration of the zootechnical performance

ALGAE group showed a stronger serum antioxidant barrier

Slight reduction in the presence of coliform bacteria

Ascophyllum nodosum and *Lithothamnium calcareum* can be considered valid functional additives to be added to animal feed to improve the general state of health while reducing the use of antibiotics to prevent the emergence of pathogenic bacteria during the most critical stages of the production cycle.



Innovazione e ricerca

Bando Seal of Excellence (SoE) SEED 2020: 38 progetti finanziati



Thanks

Dr. Sara Frazzini
sara.frazzini@unimi.it



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