PRELIMINARY RESULTS ON THE NUTRITIONAL VALUE FOR POULTI *ULVA LACTUCA* PRODUCED IN BIOFILTERING TANKS

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INTRODUCTION

The use of microalgae (including cyanobacteria) in poultry nutrition ha extensively studied in comparison with seaweeds (reviewed by Indergaard & 1991). The main differences between micro and macroalgae are the high prote than 50%) and low ash (less than 10%) content of microalgae ; otherwise, cr content (about 5%) is similar in both kind of algae.

The objective of this study was the study of the basic nutritional parameters biomass cultivated in running through enriched nitrogen seawater, and the different seaweed supplements on the true (TME) and apparent metabolizabl (AME) and growth trials of chick and cockerel.

MATERIAL AND METHODS

Weekly harvest of *Ulva rigida* cultivated, at 2 and 4 g/l initial density, in 750 l tanks with a daily continuous flow (exchange rates of 4 volumes per day) of NH_4^+ from *Sparus aurata* waste waters, and a ammonium efficiency removal was washed with fresh water and sun-dried to 15% relative humidity, before grinded, analyzed and used as feed supplement.

Basic nutritional values, true and apparent metabolizable energy of N-enrich were determined. Two standard diets (A and B) with different seaweed i percentages (10, 20 and 50%) were comparatively studied in chicks and cockerels

RESULTS AND DISCUSSION

Basic nutritional parameters analysed in the powder-grinded biomass are given in Table 1.

Table 1 : Basic nutritional values of N-enriched biomass of *Ulva rigida* (g.kg^{-1} DM).

Nitrogen	28	CA	5
Oil	14	P	1
Crude Fiber	40	Cl	39
NDF	35	Na	9
ADF	30	K	24
Ash	190	Mg	15
Gross energy	1.1 Mj.Kg.DM		

(NDF= Neutro Detergent Fiber; ADF= Acid Detergent Fiber)

The TME of *Ulva rigida* as the sole diet or as 10, 20 or 50% supplement to two standard diets or glucose, are given in Table 2. The TME of *Ulva rigida* as the exclusive diet was 5.7 Mj.Kg DM for chicks and 4.3 Mj.Kg^{-1} DM for cockerels. In general (except for chicks with diet A), the addition of *Ulva* meal (up to 20%) to chick and cockerels standard diets did not modify the TME values (Table 2). Significative differences between chicks and cockerels with standard B diet may be related to the addition of seaweed, but only at 20% supplementation.

Table 2.- True Metabolizable Energy Values (Mj.Kg^{-1} DM) of N-enriched *Ulva rigida* and *U. rigida* supplements to standard diets, on chick and cockerels (n= 40 per treatment).

	Chick	Cockerels	
Seaweed	5.7± 0.31	4.3± 0.37	*
Standard A diet :			
0% seaweed	15.3± 0.35	14.4± 0.23	NS
50% seaweed	13.8± 0.33	14.6± 0.47	NS
	*	NS	
Standard B diet :			
0% seaweed	13.6± 0.16	13.1± 0.10	NS
10% seaweed	13.8± 0.31	12.6± 0.27	NS
20% seaweed	13.9± 0.16	12.3± 0.26	***
	NS	NS	
Glucose (MJ/kg air dried) :			
0% seaweed	(Gross energy) 15.7		
10% seaweed	15.7± 0.20	15.5± 0.06	NS
20% seaweed	15.3± 0.30	15.3± 0.19	NS
	NS	NS	

(*= significative; NS= not significative)

Growth trial was performed with chicks (N=40 per treatment) feeded during 10 day with standard diet and 10, 20 or 30% *Ulva* meal supplements. Résults are given Table 3. The AME values did not exceed 3.2 Mj.Kg^{-1} DM, being too low for poultr diets. The inclusion of *Ulva* decreased the metabolizable energy (ME) of diets (ME 10.6-0.08 x %inclusion, R2=0.73). However, addition of *Ulva* did not modify th metabolizable energy of the standard diet, indicating the absence of antinutrition factors by *Ulva* supplements.

Although, the decrease of weight gains is clearly related with the increase in *Ulv* supplements (non quantified), a negative relation with *Ulva* supplementation ar the amount of feed consumed by chicks chould be considered. The lower acceptance seaweed supplemented diets is probably due to organoleptic factors. Adaptation seaweed meals have been described in longer-living animals, but are impossible performe in poultry.

Table 3.- Weight gain (g) and apparent metabolizable energy (AME) (Mj.Kg^{-1} DW) of chicks feed on standard and *Ulva* -supplemented diets after 10 days, (N=40).

	Weight gain	AME
Standard diet	102 g	10.5 Mj/Kg
Standar + 10% seaweed	90 g	10.0
Standar + 20% seaweed	85 g	8.3
Standar + 30% seaweed	77 g	8.3

CONCLUSIONS

Diets containing 10% or higher supplements of crude meal of N-enriched *Ulva rigida* are not convenient for chicks and cockerels. Valorization of seaweed supplemented feed for monogastric animals based only on the values of total metabolizable energy can lead to wrong conclusions.

The effect of additives (enzymes, yeast, etc.) to improve the nutritional value of *Ulva*-supplemented feed, as well as digestibility trials with ruminants, should be evaluated in order to assess the suitability of *Ulva* as feed supplement.

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