



UNIVERSITY OF LIFE SCIENCES "KING MIHAI I"
FROM TIMISOARA
"YOUNG PEOPLE AND MULTIDISCIPLINARY
RESEARCH
IN APPLIED LIFE SCIENCES"
21-22 November, 2024



Young people and
multidisciplinary
research in applied life
sciences"

THE INCLUSION OF SORGHUM IN THE DIET OF FARMED COMMON CRAP
CYPRINUS CARPIO L.

Mălina-Andreea DĂNCIUG (ROTARU), Bianca-Petruța TIHINIUC-POPA, Benone PĂȘĂRIN
Ion Ionescu de la Brad "University of Life Sciences Iasi, Aleea Mihail Sadoveanu no. 3, 700490, Iasi, Romania

Abstract :

The present study investigated the effects of sorghum inclusion in carp (*Cyprinus Carpio*) diets on growth, blood parameters, meat composition, microbiota in carp. Experimental diets with varying sorghum contents were fed to carp with an initial body weight of 50 g. The diets were tested for the presence sorghum in the diet. In particular at 30% sorghum completely replaced corn and barley. Inclusion of sorghum reduced final body weight and growth, especially in the R₄ group with 30% sorghum. However, other physiological parameters such as feed requirement, specific growth rate and organ index were not affected. Carp meat protein content and salt increased with increasing sorghum inclusion rate. In addition, there was a positive correlation between sorghum concentration and malondialdehyde levels and a negative correlation with glutathione levels, indicating a breakdown of antioxidant defense mechanisms and an increase in oxidative stress.

• Introduction

○ Aquaculture plays a significant part in assembly the worldwide request for nourishment and sustenance, being the speediest developing nourishment industry segment.
○ Be that as it may, the segment faces critical challenges, especially related to bolster. The challenge with respect to nourishing stems from the rising costs and shortage of conventional fixings like fish meal and fish oil, requiring the investigation of economical options, in this setting recognizing and coordination elective fixings into aqua feed definitions gets to be progressively pivotal. This not as it were addresses financial concerns, but too adjusts with supportability objectives by decreasing dependence on limited marine assets.

• Material and method

○ In 2024, at the research site, we carried out natural breeding in a pond using carp parents from the station, 100 carp fingerlings were chosen from a group of individuals, each weighing 50 grams at the start. The fish were moved to the station's circulating aquaculture system and adjusted to the new environment before the experiment began. The feeding experiment lasted for four weeks, starting in August and ending in September.

Table 2. Nutritional makeup of the elements utilized in trial sorghum meals for carp.

Ingredient	Moisture	Fat	Protein	Ash
Sorghum	14.02	3.78	15.24	15.16
Sunflower meal	10.34	1.56	40.98	7.23
Peas	11.60	-	23.13	-
Corn	12.57	4.01	8.16	-
Barley	11.34	-	12.33	-
DDGS	10.03	-	25.96	4.23
Fish meal	10.34	7.90	37.43	21.33

Ingredient	Sugar	Fiber	Calcium	Starch
Sorghum	2.22	4.32	1.20	52.12
Sunflower meal	-	20.34	-	-
Peas	-	-	-	-
Corn	-	-	-	80.12
Barley	-	5.37	-	49.96
DDGS	-	10.18	-	4.18
Fish meal	-	-	-	-

Table 3. Ingredients and composition of experimental diets for carp.

Ingredient	R0 (0%)	R1 (10%)	R2 (20%)	R3 (30%)
Sorghum	-	12	22	25
Sunflower meal	22	22	22	24
Peas	22	22	22	19
Corn	12	10	9	-
Barley	10	6	-	-
DDGS	12	12	12	7
Fish meal	4	4	2	-
Sunflower oil	3	2	2	-

• Results and discussions

The following growth results were found for carp. The findings show a noticeable pattern in how well common carp grow when their diets include different amounts of sorghum. When the amount of sorghum went up from R₀ to R₃, there was a clear drop in both the final body weight and weight gain.

Table 4. Chemical composition of carp meat when given sorghum diets in an experiment.

Parameter (%)	R0 (0%)	R1 (10%)	R2 (20%)	R3 (30%)
Protein	14.76	15.95	18.00	14.87
Fat	5.92	5.34	6.72	6.03
Moisture	68.23	69.72	67.97	68.91
Ash	2.54	2.96	2.96	2.93
Salt	2.20	3.52	3.80	2.50
Collagen	1.12	0.69	0.62	0.89

. Figure 1. The effect of sorghum on oxidative status in the muscle, liver, and intestinal tissues of *Cyprinus carpio*

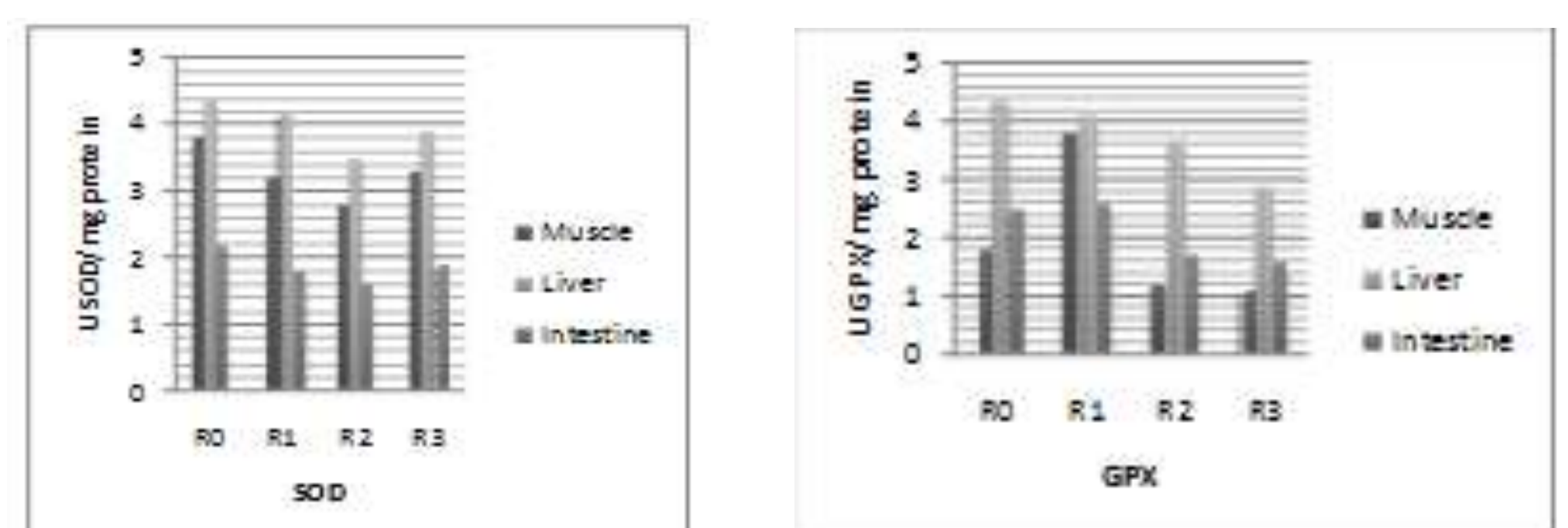
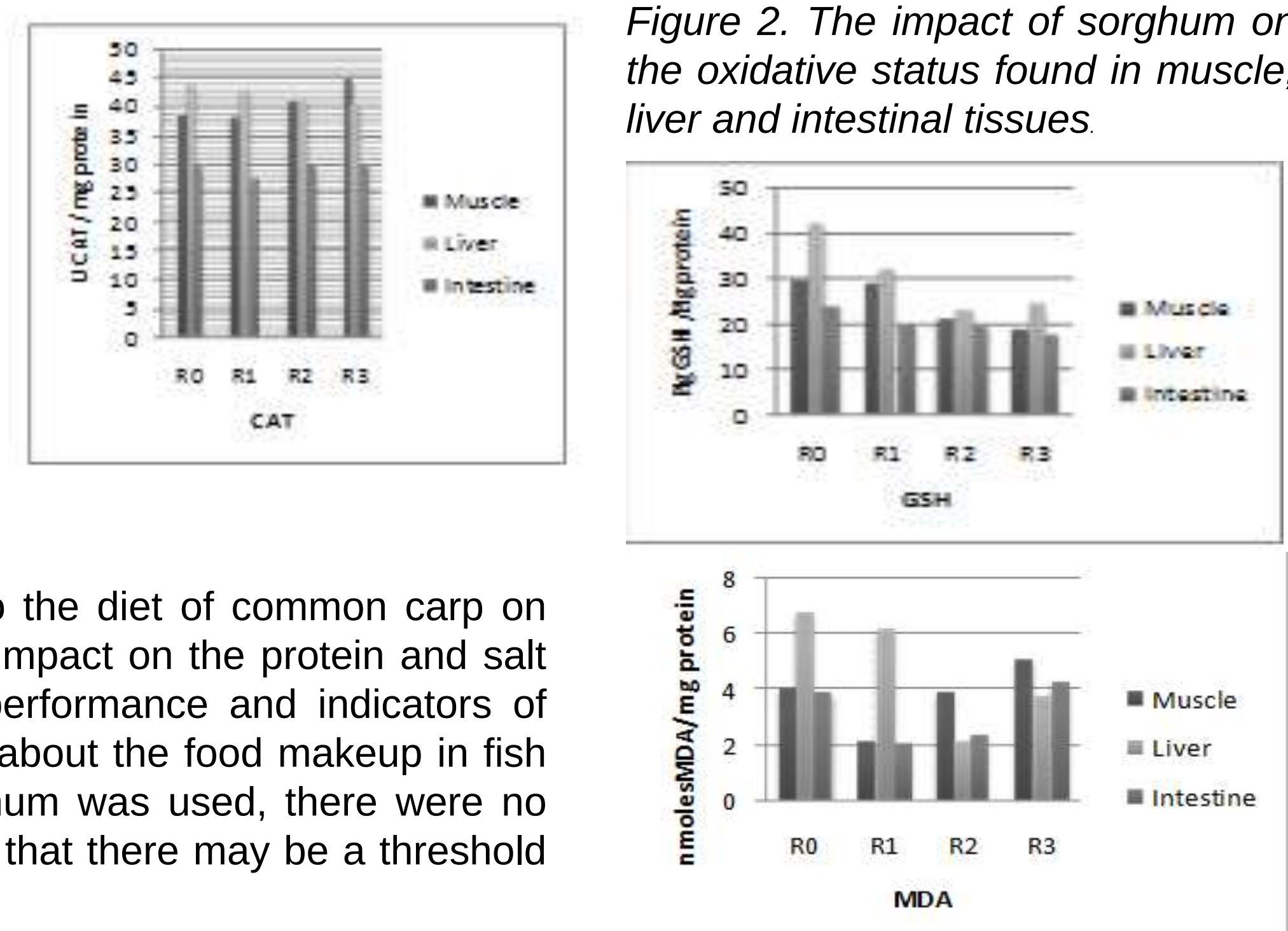


Figure 2. The impact of sorghum on the oxidative status found in muscle, liver and intestinal tissues.



• Conclusions

This research emphasizes the important effect of adding sorghum to the diet of common carp on different physiological measurements. While sorghum had a positive impact on the protein and salt levels in the fish's flesh, it had a negative effect on their growth performance and indicators of oxidative stress. These results emphasize the need to carefully think about the food makeup in fish diet to improve growth and overall health. Notably, when 10% sorghum was used, there were no major effects on the final body weight and weight gain. This suggests that there may be a threshold at which the negative effects on growth performance can be reduced.