

## Postprandial Ammonia Excretion and Digestibility in Three Strains of the Red Sea Bream (*Pagrus major*)

Sung-Yong Oh<sup>\*</sup>, Choong Hwan Noh and Jong-Man Kim

Marine Resources Research Department, Korea Ocean Research & Development Institute, Ansan P.O. Box 29, Seoul 425-600, South Korea

To compare the protein utilization efficiency of the selected Korean (KK), cultured Japanese (JJ) and their intraspecific hybrid (JK) strains of red sea bream (*Pagrus major*), total ammonia excretion (TAN) and digestibility were estimated. The red sea breams (17.1 g) were stocked in 20 L circular acrylic chambers attached with faeces collection columns. They were hand-fed on a commercial diet containing 46.7% crude protein for 2 weeks, once daily (09:00 h). The feed was previously mixed with 0.5% chromic oxide ( $\text{Cr}_2\text{O}_3$ ) as an inert marker. On the 14<sup>th</sup> day of feeding, the postprandial TAN excretion of the fish was estimated from changes of inlet and outlet of each chamber every 2 h over a 24 h period. Final body weight, weight gain, feed conversion efficiency, protein efficiency ratio and specific growth rate after 2 weeks of feeding were the highest in KK strain followed by JK and JJ strains (Table 1,  $P < 0.05$ ).

Table 1. Growth and feed efficiency in the three strains of *Pagrus major*

Variables	Strain		
	JJ	JK	KK
Mean initial weight (g)	17.07±0.07	17.06±0.03	17.02±0.03
Mean final weight (g)	22.61±0.06 <sup>c</sup>	23.14±0.09 <sup>b</sup>	23.71±0.08 <sup>a</sup>
WG (%)	32.49±0.72 <sup>c</sup>	35.60±0.54 <sup>b</sup>	39.29±0.24 <sup>a</sup>
FCE (%)	73.34±1.37 <sup>c</sup>	80.34±1.19 <sup>b</sup>	88.48±0.67 <sup>a</sup>
PER	1.57±0.03 <sup>c</sup>	1.72±0.03 <sup>b</sup>	1.89±0.01 <sup>a</sup>
SGR (%/day)	2.01±0.04 <sup>c</sup>	2.17±0.03 <sup>b</sup>	2.37±0.01 <sup>a</sup>

Values are means from triplicate groups of fish, where the means with different a superscript are significantly different ( $P < 0.05$ ).

Postprandial TAN excretion rates reached the maximum values 4 h after the feeding

for the KK (31.23 mg TAN kg fish<sup>-1</sup> h<sup>-1</sup>) and 6 h after the feeding for the JJ (44.19 mg TAN kg fish<sup>-1</sup> h<sup>-1</sup>) and JK (41.70 mg TAN kg<sup>-1</sup> h<sup>-1</sup>) strains. The peak, hourly and daily TAN excretion rates were the highest in JJ strain followed by JK and KK strains (Table 2). Apparent protein digestibility did not differ significantly among the strains (Table 3, P>0.05). The selected Korean strain (KK) utilized the feed better and its fastest growth was presumably due to better dietary protein utilization.

Table 2. Nitrogen (mg kg<sup>-1</sup> d<sup>-1</sup>) consumed, egested and excreted by three strains of *Pagrus major*

	Strain		
	JJ	JK	KK
N consumed	1775.9 (100)	1756.9 (100)	1775.6 (100)
N excreted	705.7 <sup>a</sup> (39.7 <sup>a</sup> )	662.6 <sup>b</sup> (37.7 <sup>b</sup> )	623.8 <sup>c</sup> (35.2 <sup>c</sup> )
N egested	103.3 <sup>a</sup> (5.8 <sup>a</sup> )	95.4 <sup>a</sup> (5.4 <sup>a</sup> )	88.0 <sup>a</sup> (4.9 <sup>a</sup> )

Values in parenthesis are expressed as percentage of nitrogen consumed.

Values are means from triplicate groups of fish, where the means with different a superscript are significantly different (P<0.05).

Table 3. Apparent digestibility of protein in three strains of *Pagrus major*

	Strain		
	JJ	JK	KK
Digestibility (%)	94.18±0.93 <sup>a</sup>	94.57±0.65 <sup>a</sup>	95.03±0.38 <sup>a</sup>

Values are means from triplicate groups of fish, where the means with different a superscript are significantly different (P<0.05).

\*Corresponding author: [syoh@kordi.re.kr](mailto:syoh@kordi.re.kr)