Insulin-Mediated Glycemic Responses and Glucose Homeostasis in Black Sea Bream (*Acanthopagrus schlegelii*) Fed Different Carbohydrate Sources

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Abstract:

The present study was conducted to investigate the effects of dietary carbohydrate sources on insulin mediated glycemic responses and glucose homeostasis in black seabream. Four isonitrogenous (48%) and isolipidic (12%) diets were formulated to contain 20% glucose (GLU), sucrose (SUC), dextrin (DEX) and wheat starch (WS), respectively. The black seabream was randomly distributed into 12 tanks (n = 3) at a stocking density of 12 fish per tank. After 2 weeks of feeding, fishes were starved for 48 h then re-fed and sampled at 0, 1, 3, 6, 12, and 24 h. The results showed that the concentration of serum glucose increased at 1 h, peaked at 3 h, decreased at 12 h, and returned to basal level at 24 h in all dietary groups ($p < 0.05$). Overall, the results of present study indicated that dietary carbohydrate sources resulted in a hyperglycaemic situation 3 h after feeding, most likely as a response to glucose loading. Moreover, glucose metabolic responses were regulated by different carbohydrate sources at different time points, and plays a important role in clearing glucose through increased activity of insulin, glycolysis, and glycogenesis, along with gluconeogenesis suppression.