The Effect of Diet on Isthmus Deformity of *Trachinotus ovatus*

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摘要

本研究探討飼料中過氧化脂質與添加維生素 C、E 及磷對於卵形鰤鰤之影響。實驗分成 3 大組分別為低脂愈過氧化價（L, 15 meq/kg）、中油脂過氧化價（M, 60 meq/kg）及高油脂過氧化價（H, 115 meq/kg），每一大組再分為添加或未添加維生素 C、維生素 E 及礦物質磷等 5 小組（-C-E-P，-C+E+P，+C-E+P，+C+E-P，+C+E+P），全部實驗共分為 15 組。

經八週試驗結果顯示，飼料中過氧化脂質及添加維生素 C、維生素 E 及礦物質磷對卵形鰤鰤成長、體組成、存活率、肝體比與 TBAR 值皆無顯著差異。血清分析結果顯示 GOT、GPT、alkaline phosphatase 及 creatine Kinase 均以（+C-E+P）組偏高，且隨著脂質過氧化價增加而升高，以 H（+C-E+P）組最高。

經飼養十二週實驗外部病徵結果顯示，徵變形主要發生在未添加維生素 C 組，以 H（-C-E-P）組發生頻度最高達 56%。單獨未添加維生素 C 組（-C+E+P）亦呈現徵變形之症狀但頻度較低，且氧化油脂並未加劇此症狀，顯示維生素 C 不足是造成徵變形主要原因，添加維生素 C 可有效防止此症狀。此外未添加維生素 C 組徵變病徵亦增加，添加維生素 C 亦可降低發生率。氧化油脂及未添加維生素 C 或維生素 E 或礦物質磷等單一因子均導致肌肉畸形罹患率增加，因子組（-C-E-P）發生頻度最高，且隨油脂過氧化價增加而增加，以 H（-C-E-P）組最高達 60%。添加維生素 C、維生素 E 及礦物質磷均能防止肌肉畸形發生。

關鍵字：卵形鰤鰤、維生素 C、維生素 E、過氧化油脂、徵變形。
Abstract

This research was determined the effect of vitamin C, E and mineral P deficiency and different peroxidation oil (15, 60, 115 meq/kg) for *Trachinotus ovatus*. The experimental group were divided into three large low-fat peroxide value (L, 15 meq / kg); moderate-fat peroxide value (M, 60 meq / kg) and high-fat peroxide value (H, 115 meq / kg), each large group was further divided into add or no add vitamin C, vitamin E and minerals such as phosphorus and 5 groups (-C-E-P, -C+E+P, +C-E+P, +C+E-P, +C+E+P), all experiments were divided into 15 groups.

The *Trachinotus ovatus* that eight weeks the results were showed that feed lipid peroxide, vitamin C, vitamin E and minerals phosphorus on the growth, body composition, survival, HSI and TBARS were not significantly different. Serum analysis were showed that GOT, GPT, alkaline phosphatase and creatine Kinase are (+C-E+P) highest, and increase with the lipid peroxide value, which H(+C-E+P) were highest.

After the twelve weeks feeding experiment the results were showed, that isthmus-deformation were occurred in the group without vitamin C, Which H(-C-E-P) the frequency were highest (56%). No add vitamin C group (-C+E+P) were also observed the isthmus-deformation but lower that H(-C-E-P), and the oxidation lipid does not aggravate this symptom, and the results shows that vitamin C deficiency is the main reason causing of isthmus-deformation, add the vitamin C can prevent this symptom.

In addition to, that no add vitamin C group will increase the crossbite, adding vitamin C can reduce of the crossbite. Oxidation lipid and no added vitamin C, vitamin E and minerals phosphorus single factor
all can contribute to increased the muscle deformity morbidity, the multi-factor group (-C-E-P) was highest, and increased with peroxide, which H (-C-E-P) were highest (60%). Add vitamin C, vitamin E and minerals phosphorus can prevent the muscle deformity.

Keyword: *Trachinotus ovatus*; vitamin C; Vitamin E; lipid peroxidation; isthmus deformity.