

Potassium diformate influences gene expression of GH/IGF-I axis and glucose homeostasis in weaning piglets.

Highlights

- Supplementation of 10 g/kg KDF to weaning diet for 35 days increased GH mRNA expression in pituitary, up-regulated IGF-1 mRNA and IGF-1 peptide in liver without changing the level of IGF-I in plasma.
- Further, KDF-treatment effects the hepatic gluconeogenic genes expression.
- We suggest that the effects of KDF on the growth performance of weaning piglets may relate to regulation of the GH axis and glucose homeostasis.

Abstract

The objective of this study was to determine the effects of potassium diformate (KDF) on growth performance of weaning piglets and genes expression related with growth axis and hepatic gluconeogenesis.

A total of 180 piglets weaned at 28 d of age were allocated randomly into two groups, with 6 pens in each group and 15 piglets in each pen.

Piglets in the control group were fed basal diet, whereas the KDF-treated group was fed basal diet supplemented with 10 g/kg KDF.

After 5 weeks feeding, KDF-treated piglets showed higher average daily feed intake (ADFI) and average daily bodyweight gain (ADG) than those of the control ($P<0.05$), whereas the feed conversion ratio (FCR) was lower than that of the control ($P=0.02$).

The apparent digestibility of dry matter and crude protein of the KDF-treated group were higher than those of the control group ($P<0.01$).

KDF treatment did not change the blood indices level of insulin-like growth factor-I (IGF-I), high density lipoprotein (HDL), low density lipoprotein (LDL), total cholesterol (TC), triglyceride (TG) and blood glucose (BG) in plasma.

KDF treatment did not influence the mRNA expression of growth hormone releasing hormone (GHRH) and somatostatin (SS) in hypothalamus, and the levels of growth hormone receptor (GHR) and IGF-I receptor (IGF-IR) mRNA in pituitary.

Whereas, it increased the abundance of GH mRNA in pituitary, and the mRNA of GHR, IGF-I, IGF-IR, glucose-6-phosphatase (G6PC), fructose-1,6-bisphosphatase (FBP) and phosphoenolpyruvate carboxykinase (PCK) in liver ($P<0.05$).

Furthermore, KDF treatment increased the concentration of IGF-I peptide in liver ($P=0.000$). These results

suggest that, the beneficial effect of KDF on the growth performance may relate to the regulation of the GH axis and glucose homeostasis in piglets.

Keywords

Potassium diformate GH/IGF-I axis Glucose homeostasis Weaning piglets

Cited By

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