EFFECTS OF POTASSIUM DIFORMATE ON PIGLETS

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Administrative Map of China

1:12 000 000

0 120 240 360 480 km

Shanghai Academy of Agricultural Sciences (SAAS)

Zhuanghang Agricultural Science and Technology Experimental Station

Edible Fungi Institute

Horticulture Institute

Crop and Forest & Fruit Tree Institute

Eco-Environmental Protection Institute

The Biotechnology Institute

Agricultural Biological Ggene Center

Scientific andTechnological Information Institute in agriculture

Institute for Agri-food standards and testing technology

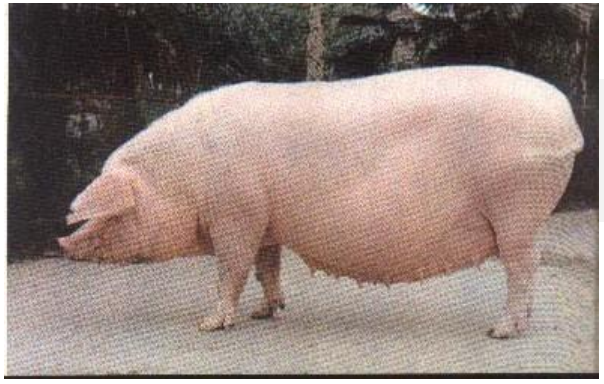
Institute of animal husbandry and veterinary Science

Institute of animal husbandry and veterinary Science

Animal husbandry

- **Poultry**
- **Pig science**
- **Small ruminant**
- **Animal environment & welfare**

Local breeds in Shanghai



Shanghai white Pig
Litter size 13.

Pudong white Pig
Litter size: 15.

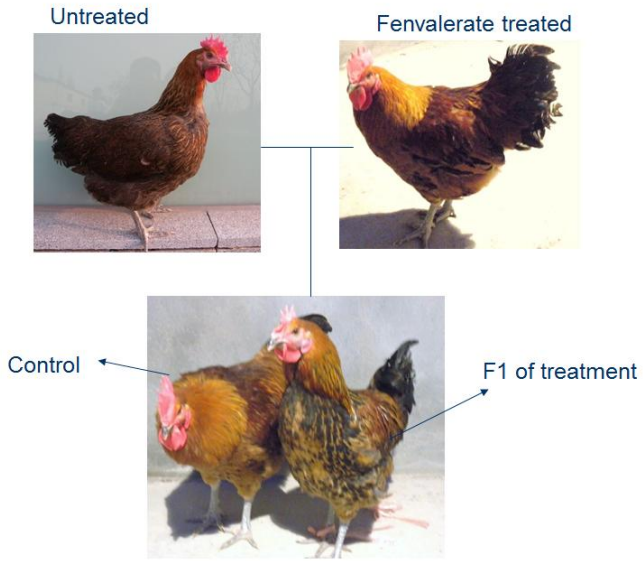
Meishan pig
Litter size: 16

Hu sheep
mature early, tender meat.

Chongming Goats

Animal Environment & Welfare

- **Agricultural endocrine disruptors on the reproductive function**
  - **Hormones variation**
  - **Reproductive performance**
  - **Secondary organ development**
  - **Mating behavior**



Dong Xia, Nahid Parvizi, Yuchuan Zhou, Kesi Xu, Hui Jiang, Rongjie Li, Yiqiong Hang, Yang Lu. Paternal fenvalerate exposure influences reproductive functions in the offspring. Reproductive Science . 2013, 20 (11): 1308-1315

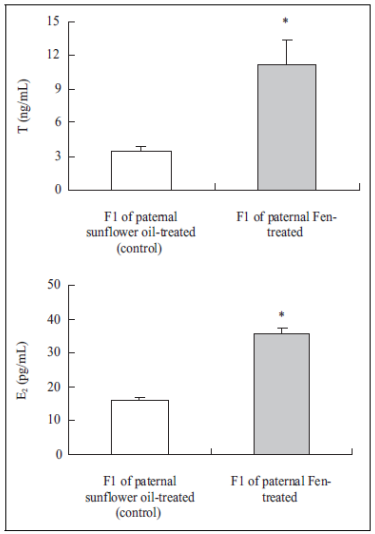


Figure 2. Effect of paternal fenvalerate (Fen) treatment on serum concentrations of testosterone (T) and estradiol-17β (E_2) in male offspring (F1). *= $P \leq .05$ versus control. F1 males from 1 dam are considered as a repeat, there are 10 F0 dams in each group. The values are presented as mean ± standard error of the mean (SEM).

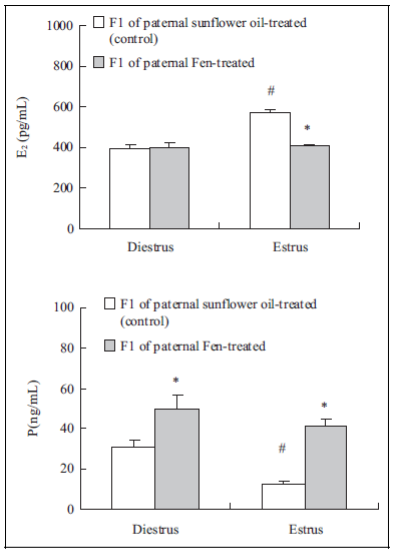


Figure 3. Effects of paternal fenvalerate (Fen) treatment on serum concentrations of estradiol-17β (E_2) and progesterone (P) in female offspring (F1). *= $P \leq .05$ versus control F1 mice at the same stage of estrus; # = $P \leq .05$ estrus versus diestrus within the same treatment group. F1 females from 1 dam are considered as a repeat, there are 10 F0 dams in each group, and each repeat has at least 2 females in estrus and 2 females in diestrus. The values are presented as mean ± standard error of the mean (SEM).

➢Nutrition, environment & Welfare

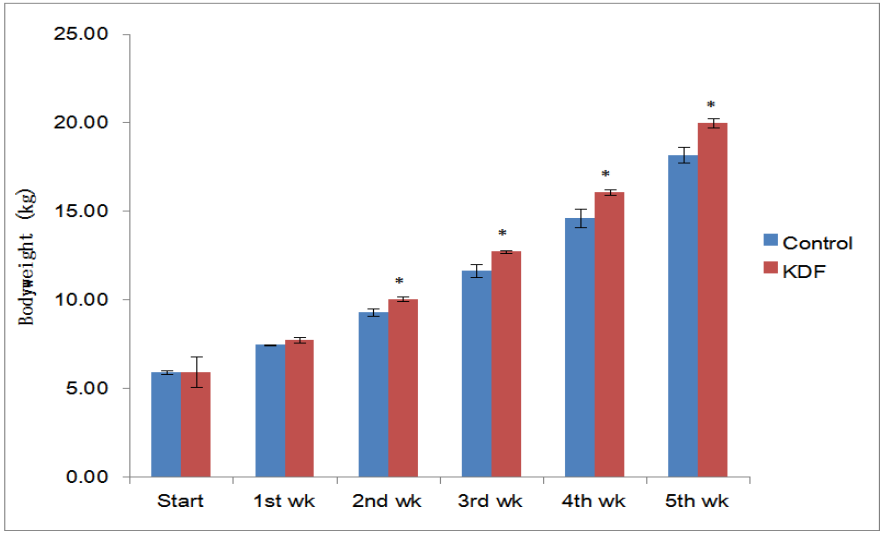
- **Sow: Diet fiber, gut microflora, fertility & healthy**
- **Weaning piglet: non antibiotic feeding**

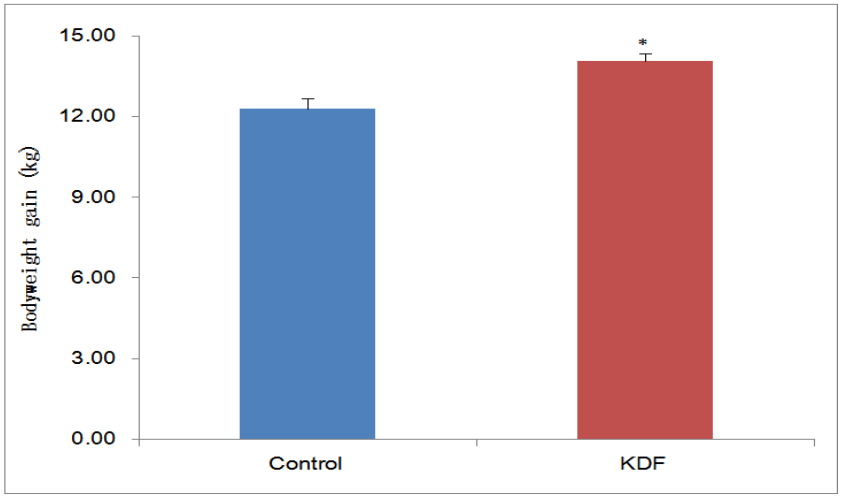
EFFECTS OF POSTASSIUM DIFORMATE (KDF) ON WEANING PIGLETS

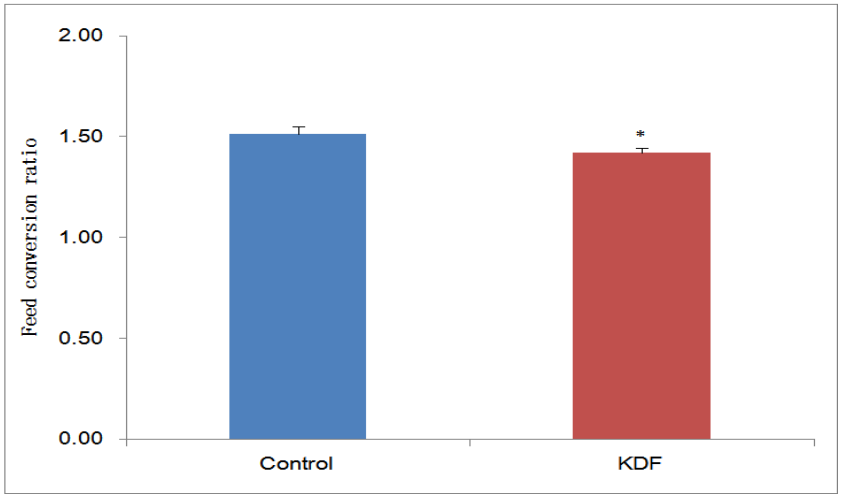
HCOOH·HCOOK

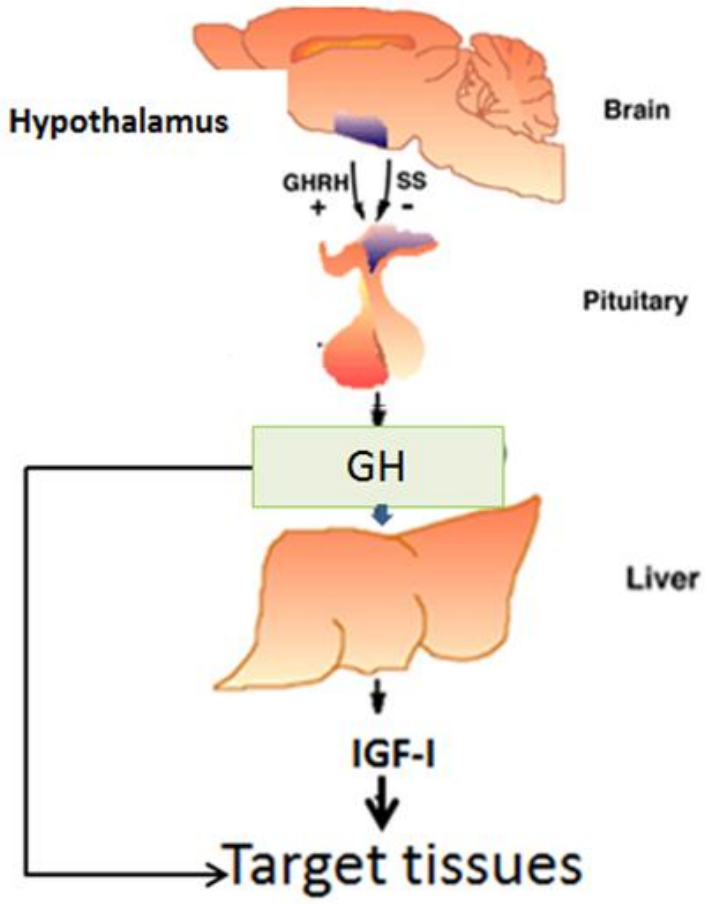
KDF: Control diet + 1% KDF

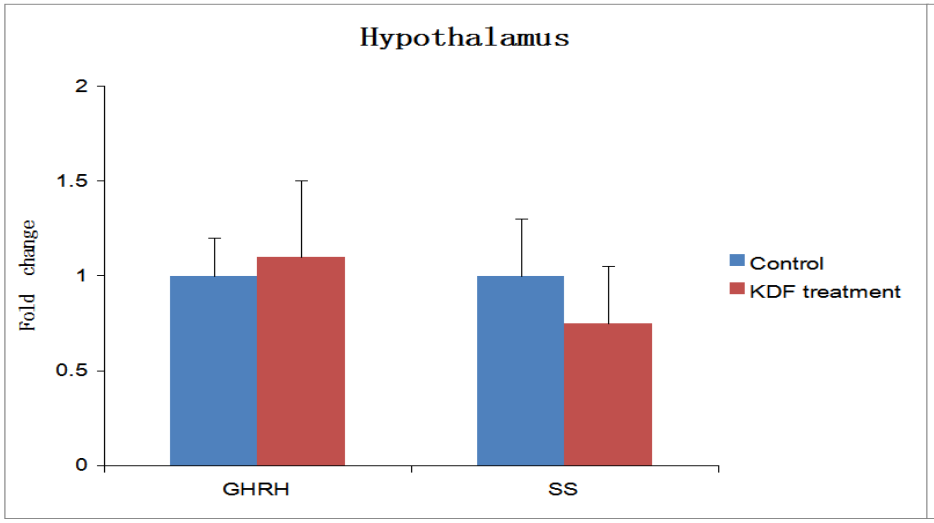
N=6, 15 male piglets in each replication

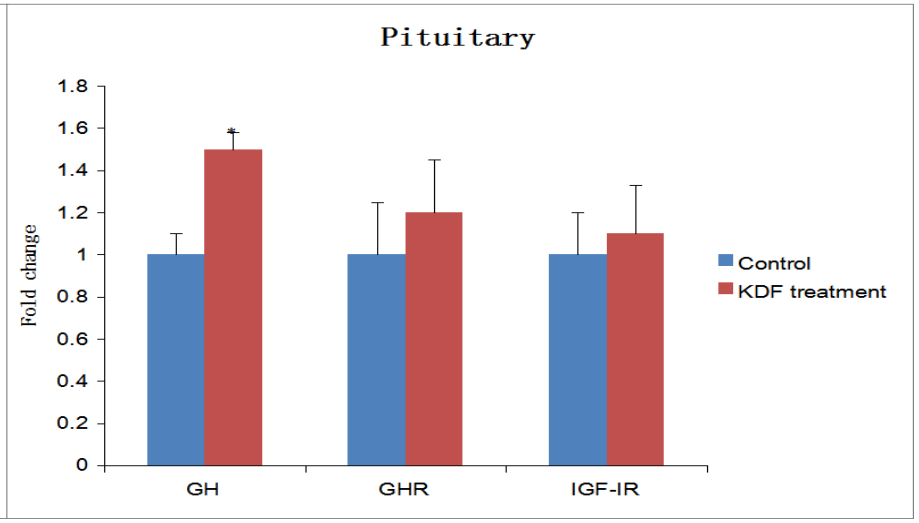


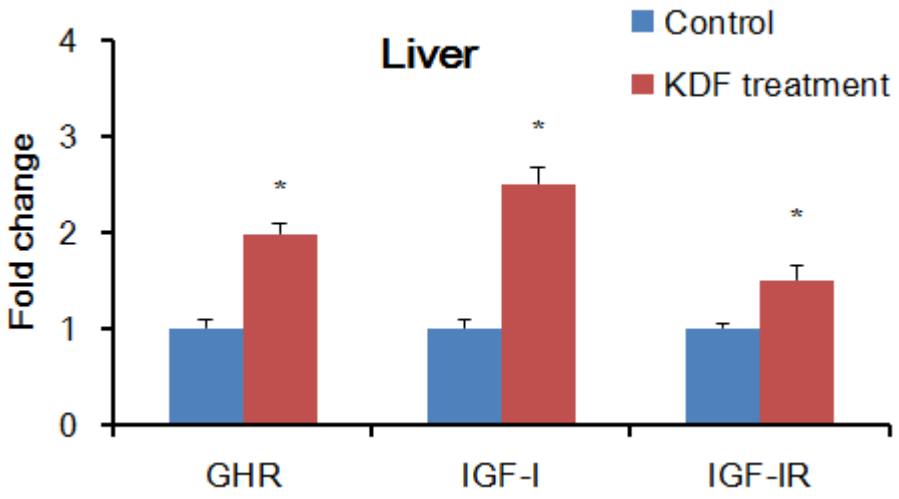

15.00
12.00
9.00
6.00
3.00
0.00
Bodyweight gain (kg)
*
Control
KDF


2.00
1.50
1.00
0.50
0.00
Feed conversion ratio
*
Control
KDF


Hypothalamus
Brain
GHRH
+
SS
-
Pituitary
GH
Liver
IGF-I
Target tissues

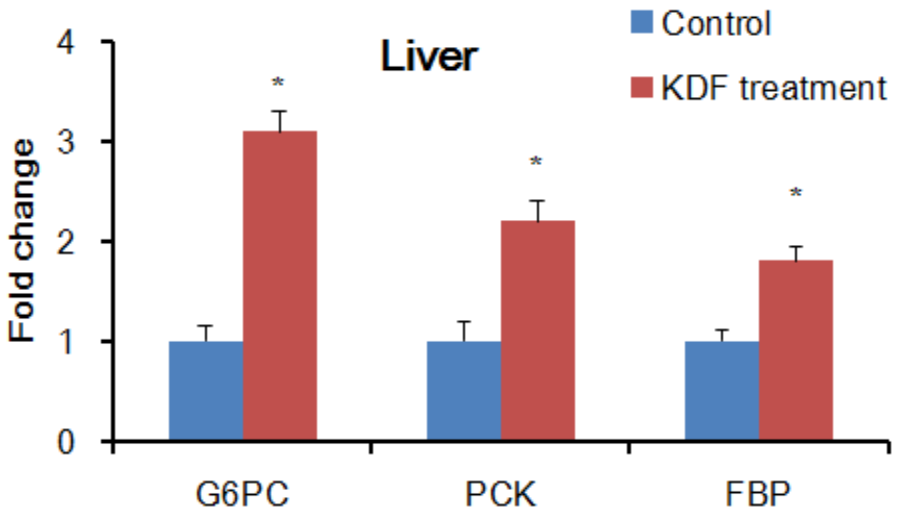






Item	Control	KDF
Plasm IGF-1 (ng/mL)	11.69 ±1.90	8.92 ±0.54
Hepatic IGF-1 (ng/mg protein)	0.37 ±0.01	1.06* ±0.03

Mean ±SEM, N=6, $P \leq 0.05$
Internal control: 18S rRNA



Abbreviations:
G6PC=glucose-6-phosphatase
PCK=phosphoenolpyruate carboxykinase
FBP=fructose-1,6-bisphosphatase

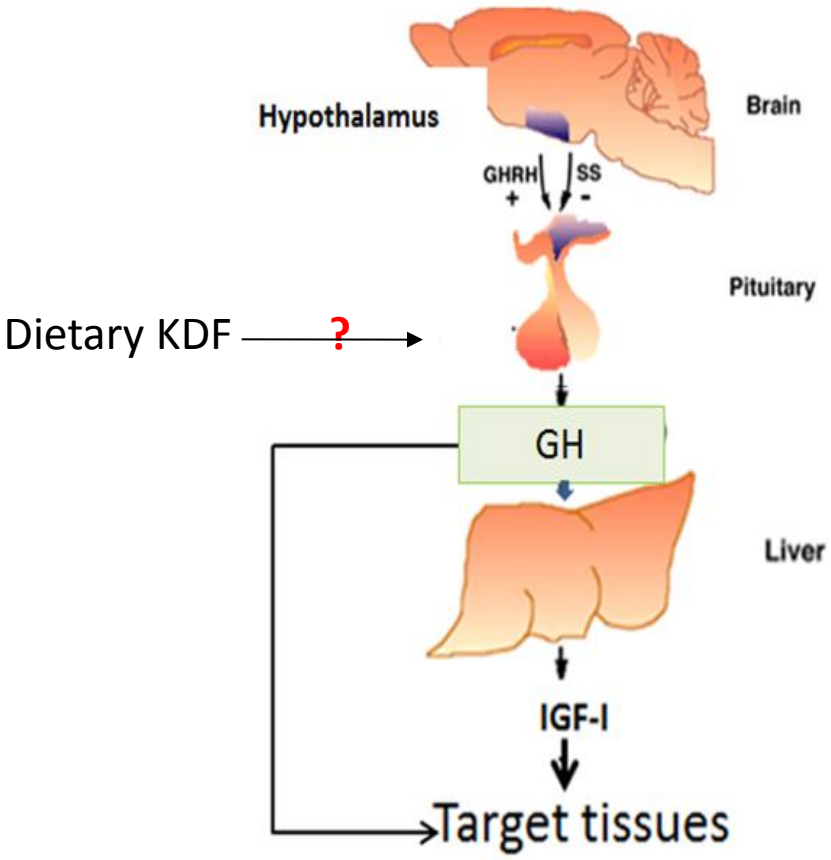
Mean ±SEM, N=6, $P \leq 0.05$
Internal control: 18S rRNA

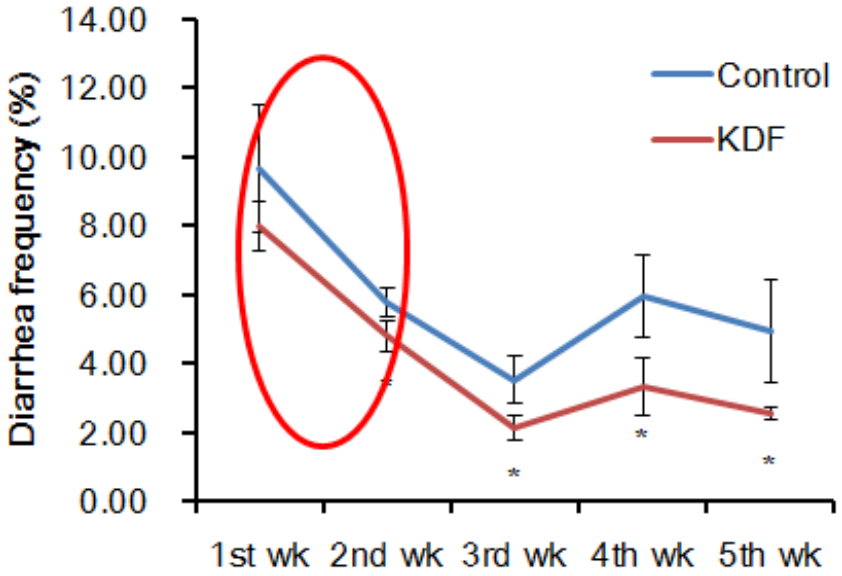
Conclusion

✓Addition of 1% KDF to the diet have positive effect on the growteh performance in the weaning piglets, and this improvement may associate with the regulation of GH axis and hepatic glucose homeostasis

Yali Zhou, Xihui Wei, Zhenggao Zi, Bingjie Zou, Shuangshuang Xia, Naisheng Lu, Hulong Lei, Yang Lu, Nahid Parvizi, Dong Xia. Potassium diformate influences gene expression of GH/IGF-I axis and glucose homeostasis in weaning piglets. Livestock Science. 2015, 172 (1): 85-90

Question?



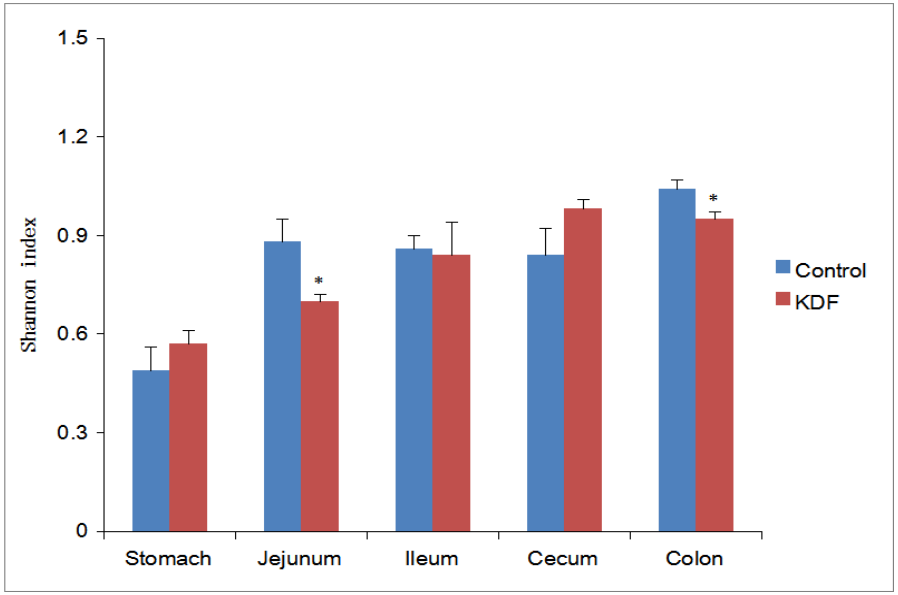


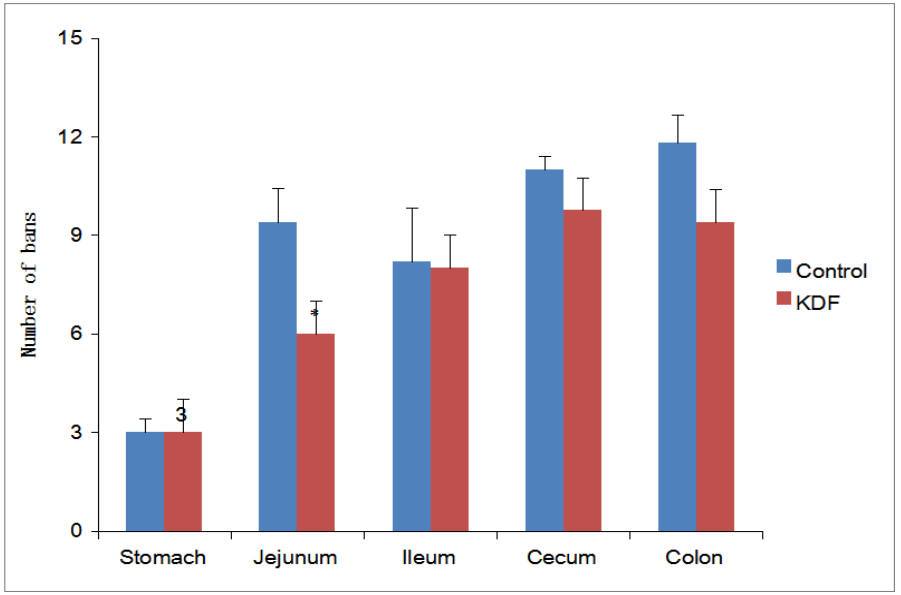
KDF: Control diet + 1% KDF

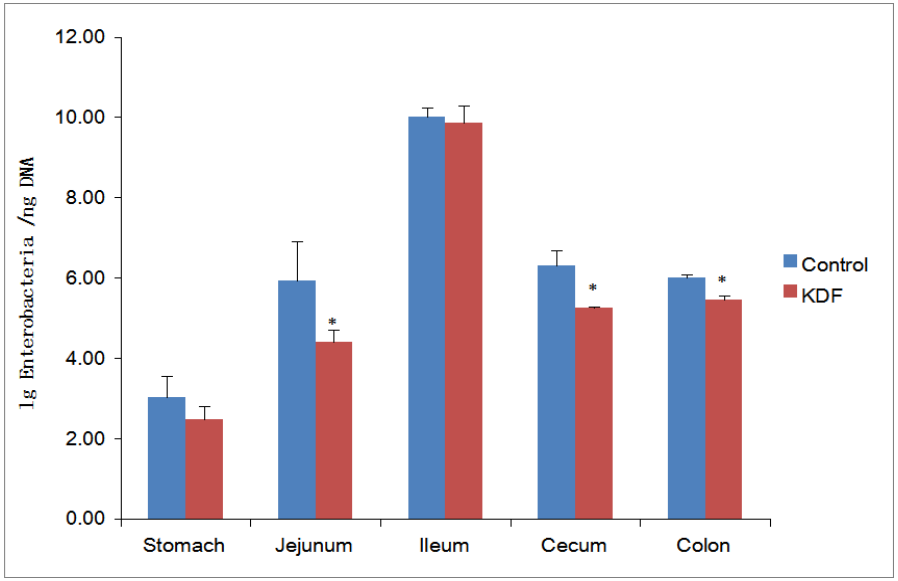
N=6, 15 male piglets in each replication

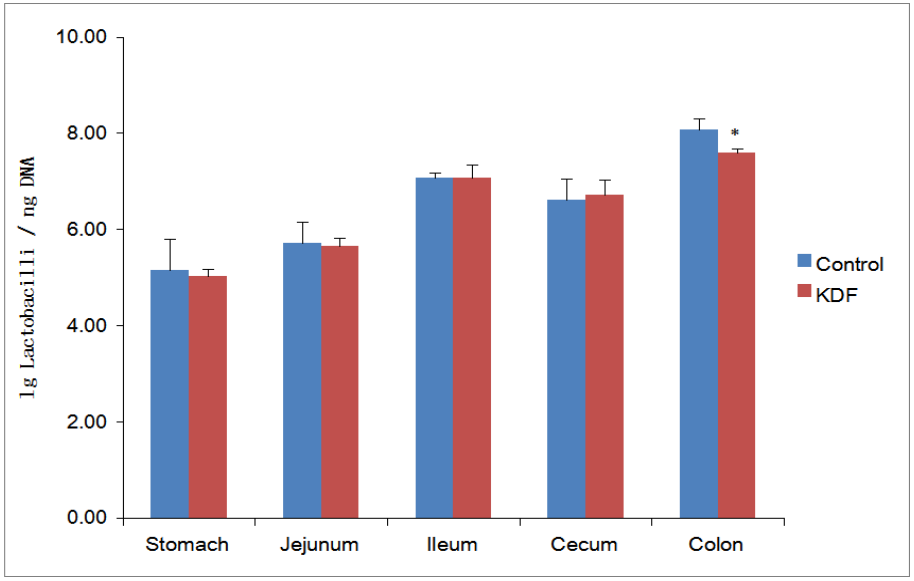
At the 2nd week

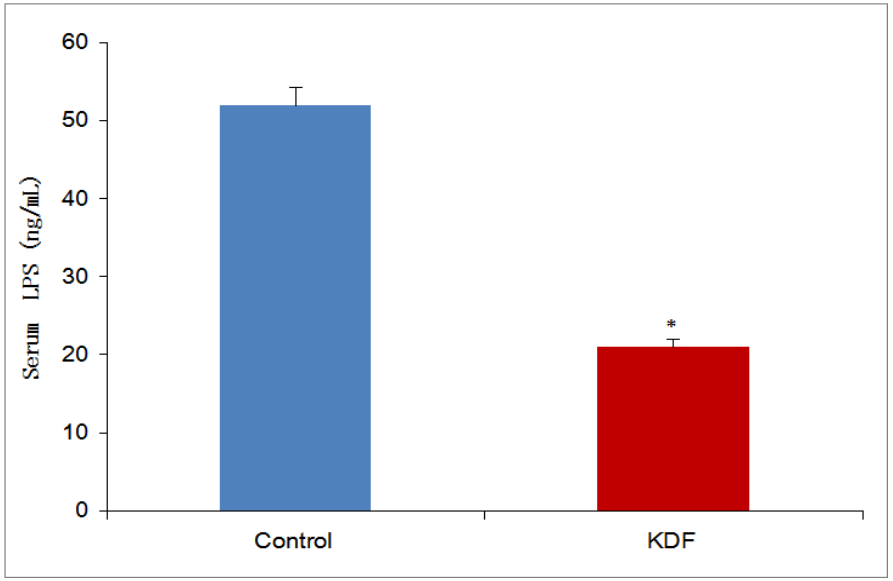
The Effects of Potassium Diformate on the Early Stage of Weaning Piglets

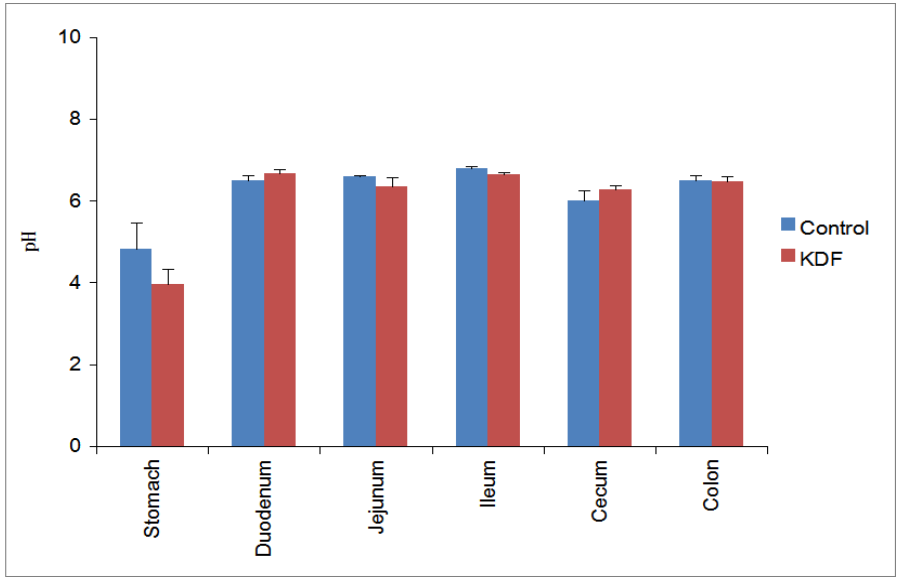












Lipopolysaccharides，LPS

- Additon of 1% KDF can decrese the level of LPS in the serum.

- Additon of 1% KDF to diet do not change the digesta pH of GI, it decrease the diversity of the microflora and the ratio of Enterobacteria copies in the digesta, but this influence effect are differ in different part of GI. ?

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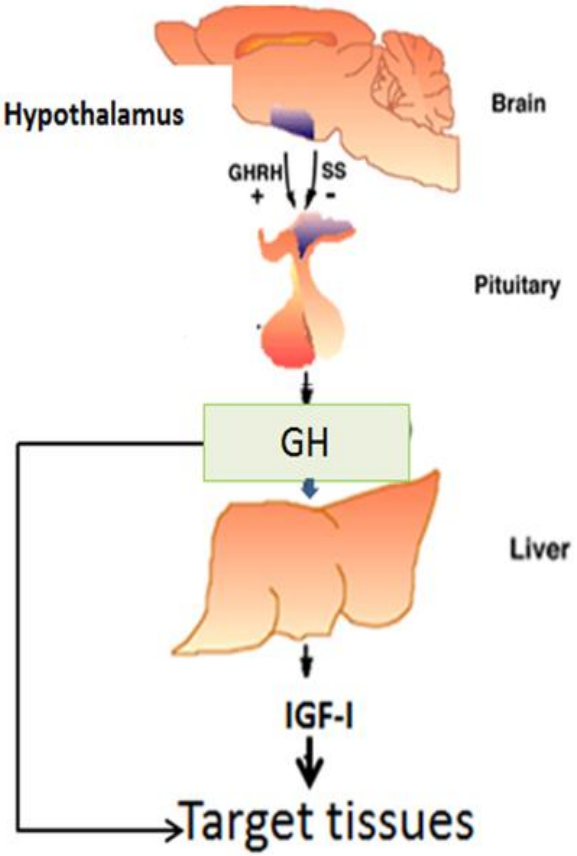
KDF → ? →  - - ? →


Hypothalamus
Brain
GHRH
+
SS
-
Pituitary
GH
Liver
IGF-I
Target tissues

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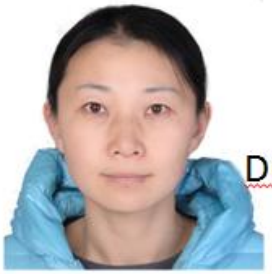

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