



## 饲料电解质平衡对断奶至2月龄生长肉兔生长性能和血液生理生化指标的影响

李君伟, 麻名文, 王雪鹏, 王春阳, 李福昌

山东农业大学动物科技学院, 泰安271018

### Effects of Dietary Electrolyte Balance on Growth Performance and Blood Physiological and Biochemical Indices of Weanling to 2-month-old Growing Meat Rabbits

LI Junwei, MA Mingwen, WANG Xuepeng, WANG Chunyang, LI Fuchang

College of Animal Science and Technology, Shandong Agricultural University, Tai'an 271018, China

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**摘要** 本文旨在探讨饲料电解质平衡对断奶至2月龄生长肉兔生长性能和血液生理生化指标的影响。选用200只断奶新西兰肉兔, 随机分为5个处理(每个处理40个重复, 每个重复1只), 饲喂不同饲料电解质平衡值(分别为-150、0、200、350和500 mEq/kg)的饲料, 预试期7 d, 正试期23 d。结果表明: 饲料电解质平衡显著或极显著影响平均日增重和平均日采食量( $P<0.05$ 或 $P<0.01$ ), 对料重比的影响不显著( $P>0.05$ )。在0~350 mEq/kg的范围内, 随着饲料电解质平衡值的增加, 生长肉兔的平均日采食量和平均日增重随饲料电解质平衡值的增加而逐渐增加, 但处理3和4之间差异不显著( $P>0.05$ )。饲料电解质平衡对血浆pH、 $\text{HCO}_3^-$ 浓度、 $\text{CO}_2$ 分压、 $\text{O}_2$ 分压和总 $\text{CO}_2$ 浓度无显著影响( $P>0.05$ ), 对碱储和阴离子间隙影响显著或极显著( $P<0.05$ 或 $P<0.01$ )。其中, 处理3、4和5的碱储极显著高于处理1和2( $P<0.01$ ), 处理3和4的阴离子间隙显著低于处理2( $P<0.05$ )。饲料电解质平衡对血清 $\text{K}^+$ 、 $\text{Na}^+$ 、 $\text{Cl}^-$ 、 $\text{Ca}^{2+}$ 、 $\text{P}^{5+}$ 浓度以及总蛋白、肌酐、磷酸肌酸激酶、谷丙转氨酶含量的影响不显著( $P>0.05$ ), 对血清葡萄糖、尿素氮和甘油三酯含量的影响显著( $P<0.05$ ), 对血清碱性磷酸酶和总胆固醇含量的影响极显著( $P<0.01$ )。其中, 处理3和4获得较低的血清甘油三酯、总胆固醇和碱性磷酸酶含量和较高的血清葡萄糖、尿素氮含量。饲料电解质平衡值为350 mEq/kg时, 血清蛋氨酸含量显著高于其他各组( $P<0.05$ )。饲料电解质平衡对血清赖氨酸、精氨酸和氨基酸总量的影响不显著( $P>0.05$ )。综合上述指标, 在本试验条件下, 断奶至2月龄生长肉兔饲料电解质平衡值以200~350 mEq/kg为宜。

**关键词:** 生长肉兔 饲料电解质平衡 生长性能 血液生理生化指标

**Abstract:** The experiment was conducted to determine the effects of dietary electrolyte balance (DEB) on growth performance and blood physiological and biochemical indices of weanling to 2-month-old meat rabbits. A total of 200 weanling rabbits were allocated into 5 treatments with 40 replicates per treatment and 1 rabbit per replicate. Rabbits in 5 treatments were fed diets with different DEB levels (-150, 0, 200, 350 and 500 mEq/kg, respectively).

There was a 7-day adaptation period and a 23-day experimental period. The results showed as follows: the DEB significantly affected the average daily feed intake (ADFI) ( $P<0.01$ ) and average daily gain (ADG) ( $P<0.05$ ), but did not significantly affect the feed/gain ratio ( $P>0.05$ ). With the DEB value increasing (0 to 350 mEq/kg), the ADFI and ADG of meat rabbits were increased, but there was no significant difference between treatments 3 and 4 ( $P>0.05$ ).

The DEB did not significantly affected the plasma pH,  $\text{HCO}_3^-$  concentration, arterial pressure of carbon dioxide ( $\text{PCO}_2$ ), oxygen partial pressure ( $\text{PO}_2$ ) and total carbon dioxide ( $\text{TCO}_2$ ) concentration ( $P>0.05$ ), but significantly affected the base excess (BE) ( $P<0.01$ ) and anion gap (AG) ( $P<0.05$ ). Meanwhile, the BE in treatments 3, 4 and 5 was significantly higher than that in treatments 1 and 2 ( $P<0.05$ ), and the AG in treatments 3 and 4 was significantly lower than that in treatment 2 ( $P<0.05$ ). The concentrations of  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Cl}^-$ ,  $\text{Ca}^{2+}$ , and  $\text{P}^{5+}$ , and the contents of total protein (TP), creatinine (CREA), creatine phosphokinase (CPK) and glutamic pyruvic transaminase (GPT) in serum were not significantly affected by the DEB ( $P>0.05$ ). The contents of glucose (GLU), urea nitrogen (UN), triglyceride (TG), alkaline phosphatase (AKP) and total cholesterol (TCHO) in serum were significantly affected by the DEB ( $P<0.05$  or  $P<0.01$ ). Besides, lower contents of serum TG, TCHO and AKP and higher contents of serum GLU and UN were found in treatments 3 and 4. The serum methionine content in treatment 4 (DEB value was 350 mEq/kg) was significantly higher than that in the other treatments ( $P<0.05$ ), and the contents of lysine, arginine and total amino acids in serum did not differ significantly among different treatments

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( $P > 0.05$ ). In conclusion, in this experimental condition, the appropriate DEB values of weanling to 2-month-old growing meat rabbits were between 200 to 350 mEq/kg. [Chinese Journal of Animal Nutrition, 2011, 23 (5) : 755 - 762]

Keywords: growing meat rabbits, dietary electrolyte balance, growth performance, blood physiological and biochemical indices

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通讯作者 李福昌, 教授, 博士生导师, E-mail: chlf@sdau.edu.cn

作者简介: 李君伟(1982—), 男, 山东潍坊人, 硕士研究生, 研究方向为动物营养和家兔生产。E-mail: ljwei710@163.com

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