禽营养 Poultry Nutrition

稻谷化学成分与酶水解能值和肉鸭真代谢能的相关关系

陈玉洁[1,2], 李燕[2], 侯文乾[2], 齐智利[2], 张宏福[3]

1. 内蒙古农业大学动物科学学院, 呼和浩特 010018;
2. 华中农业大学动物科技学院, 武汉 430070;
3. 中国农业科学院北京畜牧兽医研究所, 北京 100193

Correlations of Chemical Composition, Enzymatic Hydrolyzate Gross Energy and True Metabolizable Energy of Rice in Ducks

CHEN Yujie[1,2], LI Yan[2], HOU Wenqian[2], QI Zhili[2], ZHANG Hongfu[3]

1. College of Animal Sciences, Inner Mongolia Agricultural University, Hohhot 010018, China;
2. College of Animal Science and Technology, Huazhong Agricultural University, Wuhan 430070, China;
3. Institute of Animal Sciences, Chinese Academy of Agricultural Sciences, Beijing 100193, China

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摘要 本试验旨在探讨稻谷化学成分与酶水解能值(EHGE)和肉鸭真代谢能(TME)的相关关系。试验采集8个不同来源的稻谷样品,根据支链淀粉与直链淀粉的比值(AP/AM),选取5个代表性样品,将代表性样品采用胃蛋白酶-人工小肠液法酶法测定EHGE。然后将其化学成分与EHGE进行相关和回归分析,建立稻谷EHGE估测方程。试验选取40羽成年樱桃谷公鸭作为试验动物,用排空强饲法测定TME。然后将其化学成分与鸭TME进行相关分析。最后,将代表性稻谷样品的EHGE与鸭TME进行相关和回归分析,建立两者相关关系方程。8种稻谷的平均AP/AM为(3.97±0.97),根据AP/AM从低到高选取5种样品,并测定EHGE和鸭TME,将测得的化学成分粗蛋白质(CP)、粗灰分(Ash)、中性洗涤纤维(NDF)与EHGE建立非线性相关关系,回归方程分别为: $EHGE=6.725\ 5CP^{0.046\ 2}$ ($P<0.01$)、$EHGE=3.977\ 5Ash^{0.389\ 3}$ ($P<0.01$)、$EHGE=6.168\ 9NDF^{0.064\ 3}$ ($P<0.01$),即3种化学成分测定值与EHGE回归关系极显著。将测得的EHGE与鸭TME比较并建立相关关系,结果显示:EHGE和鸭TME之间差异不显著($P=0.878\ 5$),但也没有显著的相关性($P>0.05$)。由此可见,稻谷化学成分可以很好预测EHGE,预测鸭TME也可以得到较好结果,但稻谷EHGE与鸭TME值相关性不显著。

关键词: 酶水解能值 排空强饲法 真代谢能 樱桃谷肉鸭

Abstract: This study was to investigate the correlations of chemical composition, enzymatic hydrolyzate gross energy (EHGE) and true metabolizable energy (TME) of rice in ducks. Eight rice samples were collected, in which 5 representative samples were chosen based on the ratio of amylopectin/amylose (AP/AM). Then, the EHGE values of 5 representative samples were analyzed by pepsin-artificial small intestinal fluid method (enzymatic method). Correlation and regression analysis between chemical composition and EHGE were studied, then, the regression equations were established to predict EHGE. Forty adult male Cherry Valley ducks were chosen as experimental animals, and TME values were determined by fasting and force-feeding method. And correlation analysis between chemical composition and TME were studied. Finally, the correlation and regression analysis between EHGE and TME were investigated to established the regression equation. The average AP/AM of 8 rice samples was (3.97±0.97), and 5 representative samples were chosen based on AP/AM from low to high. Then, EHGE and TME were determined. The regression equations of EHGEs and chemical composition were $EHGE=6.725\ 5CP^{0.046\ 2}$ ($P<0.01$), $EHGE=3.977\ 5Ash^{0.389\ 3}$ ($P<0.01$) and $EHGE=6.168\ 9NDF^{0.064\ 3}$ ($P<0.01$), respectively, namely, there was a significant regression relationship between the three chemical composition and EHGE. By comparing EHGE and TME and trying to establish their relationship, there was no significant difference ($P=0.878\ 5$) and relationship between EHGE and TME ($P>0.05$). It is concluded that the chemical composition of rice can effectively predict EHGE, and the results are good by chemical composition predicting TME, but the correlation of EHGE and TME is not significant.

Keywords: enzymatic hydrolyzate gross energy, fasting and force-feeding, true metabolizable energy, Cherry Valley duck

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通讯作者 齐智利,副教授,硕士生导师,E-mail: zhiliqi@mail.hzau.edu.cn;张宏福,研究员,博士生导师,E-mail:
zhanghf6565@vip.sina.com

引用本文:

陈玉洁, 李燕, 侯文乾等 . 稻谷化学成分与酶水解能值和肉鸭真代谢能的相关关系[J]. 动物营养学报, 2013,V25(10): 2286-2293

CHEN Yujie, LI Yan, HOU Wenqian etc . Correlations of Chemical Composition, Enzymatic Hydrolyzate Gross Energy and True Metabolizable Energy of Rice in Ducks[J]. Chinese Journal of Animal Nutrition, 2013,V25(10): 2286-2293.

链接本文:

http://118.145.16.228/Jweb_dwyy/CN/10.3969/j.issn.1006-267x.2013.10.012　　　或

　　http://118.145.16.228/Jweb_dwyy/CN/Y2013/V25/I10/2286

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