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饲料中添加不同水平L-精氨酸对妊娠母猪繁殖性能及血液生化指标的影响

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Effects of Different Levels of Dietary L-Arg on Reproductive Performance and Blood Biochemical Indexes of Pregnant Sows

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摘要 本研究探讨饲料中添加不同水平L-精氨酸(L-Arg)对母猪繁殖性能及血浆一氧化氮相关指标的影响。试验选择36头2胎次母猪(长白×大约克),随机分为4组,每组9头母猪。各组饲料分别在基础饲料中添加0 L-Arg+1.70% L-丙氨酸(L-Ala)(0 L-Arg组)、0.4% L-Arg+1.02% L-Ala(0.4% L-Arg组)、0.7% L-Arg+0.51% L-Ala(0.7% L-Arg组)和1.0% L-Arg+0 L-Ala(1.0% L-Arg组),各组添加L-Ala以满足等氮平衡需要。试验期从母猪配种当天到分娩。结果表明:1.0% L-Arg组比0 L-Arg组显著提高了窝产活仔数和初生窝重($P<0.05$),随着饲料中L-Arg水平的提高,窝产仔总数和初生个体重有上升趋势($P>0.05$);母猪妊娠第30、60和90天,1.0% L-Arg组血浆中Arg、鸟氨酸含量均显著或极显著高于0.7%、0.4%、0 L-Arg组($P<0.05$ 或 $P<0.01$);母猪妊娠第90天,各组间血浆脯氨酸含量均有极显著差异($P<0.01$),但第30、60天差异均不显著($P>0.05$);母猪妊娠第30、60、90天,1.0% L-Arg组血浆一氧化氮含量和第90天血浆总一氧化氮合酶(TNOS)、诱导型一氧化氮合酶(iNOS)活性均显著或极显著高于0.7%、0.4%、0 L-Arg组($P<0.05$ 或 $P<0.01$)。经回归分析,母猪的窝产仔总数、窝产活仔数、初生窝重、血浆中各氨基酸、一氧化氮含量及TNOS和iNOS的活性与饲料L-Arg水平均有显著或极显著的线性关系($P<0.05$ 或 $P<0.01$)。结果提示,饲料中L-Arg水平变化对母猪妊娠后期血液生化指标影响明显,饲料中添加1.0% L-Arg对提高母猪繁殖性能效果最佳。

关键词: L-精氨酸 妊娠母猪 繁殖性能 一氧化氮相关指标

Abstract: This study was conducted to investigate the effects of L-arginine (L-Arg) with different levels on the reproductive performance and plasma nitric oxide (NO) related indexes of pregnant sows. A total of 36 Yorkshire × Landrace sows (2 parities) were selected and randomly assigned into 4 groups with 9 sows in each group, and sows were fed based diets added with 0 L-Arg+1.7% L-Ala (0 L-Arg group), 0.4% L-Arg+1.02% L-Ala (0.4% L-Arg group), 0.7% L-Arg+0.51% L-Ala (0.7% L-Arg group) and 1.0% L-Arg+0 L-Ala (1.0% L-Arg group), respectively, adding L-Ala to meet nitrogen balance. The experiment period was conducted from mating to farrowing. The results showed as follows: compared with the 0 L-Arg group, the number of piglets born alive and litter birth weight of all piglets in 1.0% L-Arg group were increased significantly ($P<0.05$), and with the increasing of L-Arg levels in diet, total piglets born per litter and birth weight of piglet had a tendency to rise ($P>0.05$). The Arg and ornithine contents of gestation sows in plasma on days 30, 60 and 90 in 1.0% L-Arg group were significantly or extremely significantly higher than those in 0.7%, 0.4% and 0 L-Arg groups ($P<0.05$ or $P<0.01$). The proline content of gestation sows in plasma on day 90 in the four groups were extremely significantly different ($P<0.01$), but those of gestation sows in plasma on days 30 and 60 were not significantly different ($P>0.05$). The NO content of gestation sows on days 30, 60 and 90 and the activities of total nitric oxide synthase (TNOS) and inducible nitric oxide synthase (iNOS) of gestation sows on day 90 in plasma in 1.0% L-Arg group were significantly or extremely significantly higher than those in 0.7%, 0.4% and 0 L-Arg groups ($P<0.05$ or $P<0.01$). Regression analysis showed that the total piglets born per litter, number of piglets born alive per litter, litter birth weight of all piglets born alive

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and contents of amino acids, NO and activities of TNOS and iNOS in plasma had significant and extremely significant linear relationship with dietary *L*-Arg level. In conclusion, it has obvious effects by changing the levels of dietary *L*-Arg on blood biochemical indexes of the late gestation, and it has the best effects on improving reproductive performance by adding 1.0% *L*-Arg in sow diets.

Keywords: *L*-Arg, pregnant sows, reproductive performance, NO related indexes

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- [1] BAZER F W, SPENCER T E, JOHNSON G A, et al. Comparative aspects of implantation[J]. Reproduction, 2009, 138: 195-209.
- [2] KIM S W, WU G, BAKER D H. Amino acid nutrition of breeding sows during gestation and lactation[J]. Pig News Information, 2005, 26: N89-N99.
- [3] WU G, OTT T L, KNABE D A, et al. Amino acid composition of the fetal pig[J]. The Journal of Nutrition, 1999, 129(5): 1031-1038.
- [4] 卢岩, 刘晓梅, 李书琴. *L*-精氨酸对宫内发育迟缓胎鼠胰岛素样生长因子及其结合蛋白表达的影响[J]. 中国当代儿科杂志, 2006, 8(4): 319-322.
- [5] 杨平, 吴德, 车炼强. 饲料添加*L*-精氨酸或*N*-氨甲酰谷氨酸对感染PRRSV妊娠母猪繁殖性能及免疫功能的影响[J]. 动物营养学报, 2011, 23(8): 1351-1360.
- [6] WU G, BAZER F W, CUDD T A, et al. Pharmacokinetics and safety of arginine supplementation in animals[J]. The Journal of Nutrition, 2007, 137: 1673-1680.
- [7] 张力. SPSS在生物统计中的应用[M]. 厦门: 厦门大学出版社, 2008: 8.
- [8] 江雪梅, 吴德, 方正锋, 等. 饲料添加*L*-精氨酸或*N*-氨甲酰谷氨酸对经产母猪繁殖性能及血液参数的影响[J]. 动物营养学报, 2011, 23(7): 1185-1193.
- [9] RAMAEKERS P, KEMP B, VAN DER LENDE T. Progenos in sows increases number of piglets born[J]. Journal of Animal Science, 2006, 84(Suppl. 1): 394. (Abstr.)
- [10] MATEO R D, WU G, BAZER F W, et al. Dietary *L*-arginine supplementation enhances the reproductive performance of gilts[J]. The Journal of Nutrition, 2007, 137: 652-656.
- [11] WU G, FULLER W, BAZER F W, et al. Important roles for arginine-family amino acids in swine nutrition and production[J]. Livestock Science, 2007, 122: 8-22.
- [12] 刘星达, 彭瑛, 吴信, 等. 精氨酸和精氨酸生素对母猪泌乳性能及哺乳仔猪生长性能的影响[J]. 饲料工业, 2011, 32(8): 14-16.
- [13] TAN B, LI X G, KONG X, et al. Dietary *L*-arginine supplementation enhances the immune status in early-weaned piglets[J]. Amino Acids, 2009, 37(2): 323-331.
- [14] FRANK J W, ESCOBAR J, NGUYEN H V, et al. Oral *N*-carbonylglutamate supplementation increases protein synthesis in skeletal muscle of piglets[J]. The Journal of Nutrition, 2007, 137(2): 315-319.
- [15] KIM S W, WU G. Regulatory role for amino acids in mammary gland growth and milk synthesis[J]. Amino Acids, 2009, 37(1): 89-95.
- [16] MATEO R D, WU G, MOON H K, et al. Effects of dietary arginine supplementation during gestation and lactation on the performance of lactating primiparous sows and nursing piglets[J]. Journal of Animal Science, 2008, 86(4): 827-835.
- [17] NEWSHOLM E P, BRENNAN L, RUBI B. New insights into amino acid metabolism, beta cell function and diabetes[J]. Clinical Science, 2005, 108: 185-194.
- [18] WU G Y, BAZER F W, DATTA S, et al. Intrauterine growth retardation in livestock: implications, mechanisms and solutions[J]. Archiv Fur Tierzucht: Archives of Animal Breeding, 2008, 51: 4-10.
- [19] GREENBERG S S, LANCASTER J R, XIE J, et al. Effects of no synthase inhibitors, arginine-deficient diet, and amiloride in pregnant rats[J]. The American Journal of Physiology, 1997, 273: R1031-R1045.
- [20] JOBGEN W S, FRIED S K, FU W J. Regulatory role for the arginine nitric oxide path way in metabolism of energy substrates[J]. The Journal of Nutrition Biochemistry, 2006, 17: 571-588.
- [21] MAUL H, LONGO M, SAADE G R, et al. Nitric oxide and its role during pregnancy: from ovulation to delivery[J]. Current Pharmaceutical Design, 2003, 9(5): 359-380.
- [22] WANG Y, ZHANG L, ZHOU G, et al. Dietary *L*-arginine supplementation improves the intestinal development through increasing mucosal Akt and mammalian target of rapamycin signals in intra-uterine growth retarded piglets[J]. British Journal of Nutrition, 2012(5): 1-11.
- [23] WU G, BAZER F W, HU J B, et al. Polyamine synthesis from proline in the developing porcine placenta[J]. Biology of Reproduction, 2005, 72: 842-850.
- [24] 张军民. 氨基酸在肠粘膜代谢研究进展[J]. 中国饲料, 2000(23): 30-32.

- [25] EDMONDS M S,BAKER D H.Failure of excess dietary lysine to antagonize arginine in young pigs[J].The Journal of Nutrition,1987,117:1396-1401.
- [26] LIU Z J,YIN Y L,DENG D,et al.Research on the nutrition and physiology of arginine[J].Amino Acids and Biotic Resources,2005,27(4):54-57.
- [1] 王夕国,李光玉,孙伟丽,钟伟,鲍坤,徐超,赵家平.有机螯合锰添加水平对母貂繁殖性能及仔貂生长性能的影响[J].动物营养学报,2012,24(7):1376-1383
- [2] 赵鑫,邵涛,王亚琴,罗锦标,陈维虎,孙红霞,周卫东.维生素、矿物质与能量蛋白质水平对浙东白鹅母鹅繁殖性能、血液生殖激素浓度及生殖轴相关基因mRNA相对表达量的影响[J].动物营养学报,2012,24(6):1110-1118
- [3] 麻名文,荆常亮,李福昌.饲料营养水平对妊娠及泌乳獭兔繁殖性能、血清生化指标及生殖激素的影响[J].动物营养学报,2012,24(2):364-369
- [4] 夏磊,占秀安,朱巧明,王永侠,刘伟龙,马玉娥.γ-氨基丁酸对热应激肉种鸡产蛋性能和繁殖性能的影响[J].动物营养学报,2012,24(1):137-144
- [5] 杨平,吴德,车炼强,方正锋,林燕,谯仕彦,李勇,曾毅,苏祥.饲料添加L-精氨酸或N-乙酰谷氨酸对感染PRRSV妊娠母猪繁殖性能及免疫功能的影响[J].动物营养学报,2011,23(08):1351-1360
- [6] 江雪梅,吴德,方正锋,谯仕彦,林燕,车炼强.饲料添加L-精氨酸或N-乙酰谷氨酸对经产母猪繁殖性能及血液参数的影响[J].动物营养学报,2011,23(07):1185-1193
- [7] 张志强,张铁涛,耿业业,高秀华,杨福合,邢秀梅.饲料蛋白质水平对雌性蓝狐繁殖性能的影响[J].动物营养学报,2011,23(07):1253-1258
- [8] 冯冬冬¹,吴德^{1*},车炼强¹,周东胜¹,方正锋¹,林燕¹.饲料纤维水平对妊娠母猪繁殖性能、激素分泌及仔猪器官发育的影响[J].动物营养学报,2011,23(01):25-33
- [9] 晋超,吴德^{*},方正峰,车炼强,林燕.精氨酸对妊娠母猪繁殖性能的调节作用[J].动物营养学报,2010,22(06):1495-1500
- [10] 王东卫^{1,3},曹志军^{1*},李胜利¹,黄文明¹,王瑜²,温万.牛奶尿素氮含量与奶牛繁殖性能的关系[J].动物营养学报,2010,22(06):1509-1514
- [11] 杨玉芬,葛德军,王长康.饲料纤维水平对妊娠母猪粪便指标、血清激素和生化指标的影响[J].动物营养学报,2010,22(06):1529-1535
- [12] 王二红¹,吴德^{1*},方正锋¹,车练强¹,林燕¹,赖州文².饲料中添加丁酸钾对泌乳母猪繁殖性能、血液生化指标和乳成分的影响[J].动物营养学报,2010,22(05):1367-1373
- [13] 刘俊锋^{1,2},胡慧¹,孔祥峰²,吴琛^{1,2},何若钢^{1*}.母猪精氨酸营养研究进展[J].动物营养学报,2010,22(04):840-844
- [14] 卓勇^{1,2},吴德^{1,2*},方正锋^{1,2},左晓灵^{1,3},林燕^{1,2}.日粮添加鱼油对母猪繁殖性能的影响[J].动物营养学报,2010,22(02):251-258
- [15] 李秋风,高艳霞,曹玉凤,李建国^{*},李运起.日粮能量和蛋白质水平对奶牛繁殖性能影响的研究进展[J].动物营养学报,2010,22(02):259-266