动物营养学报
CHINESE JOURNAL OF ANIMAL NUTRITION

动物营养学报 » 2013, Vol. 25 » Issue (12) :2812-2817 DOI: 10.3969/j.issn.1006-267x.2013.12.005

外周激素和营养素对家禽中枢单磷酸腺苷活化蛋白激酶的影响及其调控通路

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Effects of Peripheral Hormones and Nutrients on Central AMPK and Its Pathways in Poultry

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- 摘要
- 参考文献
- 相关文章

摘要 单磷酸腺苷活化蛋白激酶(AMPK)是一种能被腺苷一磷酸(AMP)激活的蛋白激酶,在维持整个机体的能量平衡方面起着重要作用。在家禽下丘脑中,AMPK能够通过乙酰辅酶A羧化酶-肉碱棕榈酰转移酶(ACC-CPT1)信号通路和雷帕霉素靶蛋白-真核翻译起始因子4E结合蛋白和40S核糖体S6蛋白激酶(mTOR-4EBP1/p70s6k)信号通路调控中枢内食欲因子的表达,从而影响家禽的食欲。外周激素(瘦素、脂联素、胃饥饿素、胰岛素、内源性大麻素)能够通过调节中枢AMPK的活性来影响家禽的食欲。除此之外,一些营养物质如葡萄糖、脂肪酸和氨基酸也能够通过AMPK通路来将食欲信号传输到中枢,进而影响家禽的能量代谢。

关键词: AMPK 食欲调控 下丘脑 家禽

Abstract: AMPK, an adenosine 5'-monophosphate (AMP)-activated protein kinase, plays an important role in maintaining energy balance. In avian species, hypothalamic AMPK can regulate appetite through acetyl-CoA carboxylase (ACC)-carnitine palmitoyltransferase 1 (CPT1) and mammalian target of rapamycin (mTOR)-eukaryotic translation initiation factor 4E-binding protein 1 (4EBP1)/40sribosomal protein S6 kinase1 (p70s6k) pathways. Peripheral hormones (leptin, adiponectin, ghrelin, insulin and endocannabinoid) regulate the appetite in poultry through the hypothalamic AMPK signaling pathway. Besides, some nutrients, such as glucose, fatty acids and amino acids, can also transmit appetite-related signals to the center by AMPK pathway, and modulate energy metabolism.

Keywords: AMPK, appetite regulation, hypothalamus, poultry

收稿日期: 2013-07-17;

基金资助:

国家自然科学基金(31172226);山东省现代农业产业技术体系项目

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引用本文:
孙晓蕾, 刘磊, 宋志刚 . 外周激素和营养素对家禽中枢单磷酸腺苷活化蛋白激酶的影响及其调控通路[J]. 动物营养学报, 2013,V25(12): 2812-2817

SUN Xiaolei, LIU Lei, SONG Zhigang . Effects of Peripheral Hormones and Nutrients on Central AMPK and Its Pathways in Poultry[J]. Chinese Journal of Animal Nutrition, 2013,V25(12): 2812-2817.

链接本文:
http://118.145.16.228/Jweb_dwyy/CN/10.3969/j.issn.1006-267x.2013.12.005 或
http://118.145.16.228/Jweb_dwyy/CN/Y2013/V25/I12/2812

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