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论文

食品供应链中质量投入的演化博弈分析

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Investment Decision of Food Supply Chain Quality Based on the Evolutionary Game

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- 摘要
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摘要 针对频频出现的食品安全事件,以及食品供应链质量投入的外部正效应问题,建立了供应商与制造商食品质量投入的演化博弈模型,并进行求解分析。结果表明:食品供应商与制造商的质量投入策略与双方质量投入产出比密切相关,当双方质量投入产出比不断变化时,出现多种演化稳定均衡。如果"搭便车"行为从对方质量投入中获得的收益很大,则供应商或者制造商进行质量投入的积极性会大大降低。政府进行调控,对于"搭便车"行为进行惩罚,迫使供应商或制造商进行质量投入,对于质量投入产出比较小的供应商或制造商给予补贴,激励他们进行质量投入,增大食品的安全性。

关键词： 食品供应链 质量投入 演化博弈

Abstract： Food accidents occur frequently and the positive external effect of investment of food quality exits in the food supply chain. Investment decisions of suppliers and manufacturers in food safety are analyzed base on evolutionary game. The results show that the investment strategies of both suppliers and manufacturers are related to the ratio of input-output. When the input-output ratios of both game parties in the food supply chain change, some evolutionarily stable equilibrium is found. If 'free rider' can gain a lot in the supply chain, suppliers or manufacturers will not like to invest in the food quality. The government will use macro-control to increase the food security level through two kinds of mechanisms. On one hand, it will punish the "free rider" behavior and force the supplier or manufacturer to input quality. On the other hand, it will provide subsidies for the supplier or manufacturer with a relatively small input-output ratio and encourage them to invest in quality.

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[1] Akerlof G A. The market for "lemons": quality uncertainty and the market mechanism[J]. The Quarterly Journal of Economics, 1970, 84(3) 488-500.

[2] Caswell J A, Padberg D T. Toward a more comprehensive theory of food labels[J]. American Journal of Agricultural Economics, 1992, 74(2 460-468.

[3] Li Qin. An effective way to imporve the performance of food safety governance based on cooperative game[J]. Agriculture and Agricultu Science Procedia, 2010, 1(1):423-428.

[4] Gartinez M, Fearne A, Caswell J A, Henson S. Co-regulation as a possible model for food safety governance: opportunities for public-private parterships[J]. Food Policy, 2007, 32(3):299-314.

[5] Eijlander P. Possibilities and constraints in the use of self-regulation and co-regulation in legislative policy: experiences in the Netherland lesson to be learned for the EU?[J]. Electronic Journal of Comparative Law, 2005, 9(1).

[6] Mancur Olson J. The logic of collective action: public goods and the theory of groups[M]. Cambridge: Harvard University Press, 1965.

[7] Maynard S J, Price G R. The logic of animal conflict[J]. Nature, 1973, 246(2):15-18.

[8] Maynard S J. The theory of games and the evolution of animal conflict[J]. Journal of Theoretical Biology, 1974, 47(1):209-221.

[9] Webull J. Evolutionary game theory [M]. Boston: Princeton Press, 1998: 32-48.

[10] Xiao Tiaojun, Yu Gang. Supply chain disruption management and evolutionarily stable strategies of retailers in the quantity-setting duopo situation with homogeneous goods[J]. European Journal of Operational Research, 2006, 173(2):648-668.

[11] Xiao Tiaojun, Chen guohua. Wholesale pricing and evolutionary stable strategies of retailers with imperfectly observable objectives[J]. European Journal of Operational Research, 2009, 196(3):1190-1201.

[12] Zhu Qinghua, Dou Yijie. Evolutionary game model between governments and core enterprises in greening supply chains[J]. System Engineering Theory and Practice, 2007, 27(12):85-89.

[13] Krumwiede D W, Sheu C. A model for reverse logistics entry by third-party provides[J]. Omega, 2002,(30):325-333.

[14] Yu Haisheng, Zeng A Z, Zhao Lindu. Analyzing the evolutionary stability of the vendor-managed inventory supply chains[J]. Computer ar Industrial Engineering, 2009, 56(1):274-282.

[15] 王永平,孟卫东.供应链企业合作竞争机制的演化博弈分析[J]. 管理工程学报,2004,2(18):96-98.

[16] 黄敏镁.基于演化博弈的供应链协同产品开发合作机制研究[J]. 中国管理科学,2010,6(18):155-162.

[17] 单汨源,吴炜炜,江黎明.制造商与零售商合作广告的动态非对称演化博弈[J]. 软科学,2009,4(23):25-29.

[18] Ma Xin. Analysis on quality control in food supply chain based on dynamics evolutionary game model. 2010 International Conference on Intelligent Computation Technology and Automation (ICICTA). Changsha, 2010.

[19] 谢识予.经济博弈论[M]. 上海:复旦大学出版社,2002.

[20] Friedman D. Evolutionary game in economics[J]. Econometrica,1991,59(3):637-666.

[21] 高山晟.经济学中的分析方法[M]. 北京:中国人民大学出版社,2001.

[1] 郭本海, 方志耕, 刘卿.基于演化博弈的区域高耗能产业退出机制研究[J]. 中国管理科学, 2012,(4): 79-85

[2] 张春辉 陈继祥 .考虑内生溢出与R&D投入的创新模式选择 [J]. 中国管理科学, 2011,19(3): 26-32

[3] 黄敏镁 .基于演化博弈的供应链协同产品开发合作机制研究 [J]. 中国管理科学, 2010,18(6): 155-162

[4] 周学广 张 坚 杜建国 .基于逆向拍卖的演化博弈分析 [J]. 中国管理科学, 2010,18(5): 171-178

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