


The Livestock & Poultry (Park) Industry Greening
and Environmental Policy

畜禽(园区)产业绿色化 及环境政策研究

吴一平◎著

 中国农业出版社

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内 容 摘 要

近十多年来我国畜禽产业飞速发展，规模化养殖加工已成为许多地区的支柱产业，并形成了集“畜禽繁育、饲料加工、畜禽养殖、屠宰分割、加工储运”于一体的畜禽园区。但每年因畜禽疫病流行、有害物质残留超标、养殖环境恶劣等导致我国畜禽产品出口屡屡受阻、危害人体健康和生命安全的恶性事件时常发生，造成了巨大的经济损失，严重影响了社会稳定；与此同时，园区的废水、粪便和空气污染等“畜产公害”等环境问题愈加突出。因此，加强畜禽园区产业绿色化及环境政策研究，对于推进我国畜禽产业可持续发展具有重要的实践意义。

畜禽园区产业绿色化主要包括畜禽产品生产原料绿色化、畜禽产品生产环境绿色化、畜禽产品生产过程绿色化、畜禽产品绿色化和废弃物排放无害化。其核心是提供绿色的畜禽产品，并实现资源可持续利用和废弃物排放无害于生态环境。前者的实质是畜禽产品的食品安全问题，而后的实质是资源的多级和循环利用问题，减少或消除废弃物的产生及废弃物的无害化处理。畜禽园区的基本构成单元是受经济利益所驱动的微观经济主体——企业和农户。因此，在市场经济条件下，支配畜禽产业绿色化得以长远的永恒动力只能是这些企业和农户能否以此实现一定的经济利益，不管是来自市场还是来自政府。任何一个畜禽园区，如果只有生态环境效益和社会效益而没有经济效益，就根本无法运行，更谈不上持续稳定发展。

畜禽园区产业绿色化不仅涉及消费者和园区周围当代人和下代人的身体健康和生命安全，而且也触及园区众多企业、农户和广大

消费者、当地政府、当地居民的切身利益。各方利益得失的权衡及各方力量和利益的博弈，直接决定了畜禽园区产业绿色化能否实现或在多大程度上实现。为此，畜禽园区产业绿色化不仅要确保畜禽产品的食品安全，妥善处理好上述各方的利益关系，而且必须致力于解决当前处于微利状态的畜禽园区产业的增效问题，不断提高畜禽产业的经济效益，确保畜禽产业主体的利益，从而推动畜禽产业的绿色化。因而这其中有很多的理论问题值得深入研究。

本书运用生态经济学、产业生态学、制度经济学和环境经济学的有关原理，利用物质平衡理论、产品生命周期评价理论、投入产出理论、博弈论、公共政策理论等，力求从理论上解析畜禽园区产业绿色化背后深刻的经济学机理，揭示畜禽园区产业绿色化过程中企业行为的深层次原因；积极探索和研究如何在不污染环境、不破坏生态的前提下，以经济利益为主线，以循环经济为理念，构建良性循环的园区畜禽生态产业系统；怎样借助市场机制和企业管理两种手段，紧紧抓住影响畜禽园区产业绿色化的主要因素，建立健全“协同共生、源头预防、过程监控、末端治理”紧密结合的全新型的畜禽产业绿色化机制；怎样借鉴国外成功的实践和经验，针对我国畜禽产业及其环境政策的现状和不足，重构具有“约束规制和诱导激励”双重作用且相辅相成的环境政策体系。因此，该选题的研究对于指导我国畜禽产业健康发展、推进我国畜禽园区产业绿色化进程具有重要的理论意义。

本书以信阳园区为案例，运用生态产业理念，从生态学和经济学的角度，借鉴现有的相关研究成果和国内外生态产业园区等方面的成功经验，利用生态经济学、产业生态学和环境经济学的有关原理，界定畜禽产业绿色化的内涵；从实证的角度，对信阳畜禽园区的环境资源及产业概况、畜禽产品中有毒有害物质污染及残留、畜禽养殖加工对周围环境的影响、鸭产业链主要环节的投入产出、物

质资源的多层梯级利用等方面,运用物质平衡理论、产品生命周期评价理论等有关原理和投入产出模型,从生态产业的角度进行了系统分析,找出影响畜禽园区产业绿色化及物质、能量转换效率的关键环节;根据国家有关畜禽产品的绿色标准,利用实地调研的数据和资料,就园区畜禽产品绿色化、废弃物无害化处理及废弃物回收、综合利用进行经济分析;从经济利益的角度,研究分析实现畜禽园区产业绿色化的企业行为,探求其深层动因及动机;以当前国内外畜禽产品的食品安全标准为前提,针对影响畜禽园区产业绿色化的关键因子,运用制度经济学原理和产业组织理论、生态共生理论、交易费用理论等,结合信阳畜禽园区实际,探讨实现畜禽园区产业绿色化的机制及其必要的保障体系;通过对国外畜禽产业绿色化的相关政策及实践,以及我国畜禽产业政策演变及现状进行研究,系统总结了国外畜禽产业绿色化的成功经验和我国畜禽产业政策的不足,针对我国畜禽园区实际,从经济、社会和生态环境效益“三赢”的角度,就如何推进我国畜禽园区产业绿色化进程,探索实现技术先进、经济合理、环境无害和生态平衡相结合的我国畜禽园区的循环经济发展模式,进一步完善畜禽生产绿色化、畜禽产品绿色流通、畜禽产业绿色化的环境管理三个方面的政策提出了自己的建议,为全面提升我国畜禽产业的国际竞争力,迅速遏制畜禽养殖加工污染,净化农村生态环境,促进我国畜禽产业的可持续发展,走经济发展和生态良好的文明发展道路,提供有价值的参考。

1. 研究的主要结论

(1) 畜禽园区产业绿色化,就是立足于资源的可持续利用,利用绿色的原料,在绿色的区域和环境中,采用各种生态和技术措施尽可能减少畜禽产品生产、加工过程中的物耗、能耗以及废弃物的产生和排放,提供一定数量的绿色畜禽产品(无害于人体健康),并且其生产和消费过程中所产生的废弃物经过处理和综合回收利用后

对环境无害，或有利于改善生态环境、保护自然资源、优化人类生存环境的全过程。其核心是畜禽产品绿色化、资源利用可持续化、废弃物排放无害化。

（2）利用市场机制、激励机制，辅之于管制机制，促使关联度高且先进、高效、高附加值的项目和关联企业集群，特别是医药产品和废弃物无害化处理及回收利用等，拉长或滋生新的产业链条、实现多环节增值，构建“结构合理、功能完备”的畜禽生态产业系统，达到“横向耦合、纵向闭合、柔性结构、内外和谐”，是培植系统抗市场风险能力、实现畜禽园区产业绿色化的重要载体。畜禽企业从事技术资金密集型的畜禽良种繁育和畜禽产品加工储运环节、基地农户从事商品畜禽养殖的分工协作，不仅是提高畜禽产业利税水平、扩大就业、农民增收的根本，也是产生推动整个畜禽生态产业系统运转的根本动力、确保目前微利的畜禽产业产品绿色化的基础。完整的产业链条则是畜禽园区内关联企业、基地养殖户经济利益共赢和畜禽产业生态系统稳定发展的最重要保证。

（3）在市场经济条件下，支配畜禽产业绿色化得以长远的永恒动力是畜禽企业和基地农户能否以此实现一定的经济利益。提供绿色畜禽产品是园区企业获利的根本手段，废弃物回收及综合利用则是提高整个畜禽园区产业链的产值利税率的有效手段。而实行严格的国内市场准入制和产品质量安全信息公开透明制，是确保企业绿色畜禽产品享受质量差价获利和开拓市场的重要前提。畜禽园区采用人工收集、堆沤等畜禽粪便无害化处理技术，加之与此配套的养殖岗位责任制和奖励工资制，在目前有机肥市场畅销、价格适中的情况下，基本上可以解决畜禽粪便污染。但由于养殖加工废水处理量大且综合利用和循环利用技术复杂，投资和处理费很高，再加上处理后的废水无资源化利用或循环利用，故废水无害化处理是当前养殖加工尤其是屠宰加工企业沉重的经济负担和实现畜禽园区产业

绿色化的最大障碍。因此，完善的市场机制可确保畜禽产品绿色化的企业行为持续发展，并促使企业实现资源的可持续利用。

(4) 现实中，利润率偏低的畜禽产业常常出现一些在废弃物处理方面违反国家严格的环境法规的负面企业行为，很少是因环保部门与企业串谋，更多的是当地环保部门迫于当地政府的压力，或企业在废弃物无害化处理方面的无奈，主要表现在对废弃物处理费用的心理和经济承受能力相对不足。有必要采取综合措施，充分利用企业趋利避害的本性，促使企业向“动力为主、压力为辅”的“积极主动型”行为动机格局转变。

(5) 在畜禽产业必须发展，企业又确因外部市场等无法抗拒的原因而无力负担废弃物无害化处理的投资和运行费用的情况下，可将此费用适当分解，即生产者承担治理污染的投资和部分运转费用，消费者承担企业因污染治理发生的部分费用转嫁所导致产品价格的升高，当地政府在获得企业税收、解决当地居民就业、区域经济发展等良好政绩的同时，承担治理污染的监管责任和必要的补贴或支持；当地居民在享受就业、因税收增加和经济发展所带来的公共福利改善等好处的同时，承担可以容忍的环境污染。

(6) 不断提高畜禽产业的经济效益，确保生产者的经济利益是实现畜禽产业绿色化的根本。因此，以经济利益为主线，以循环经济为理念，借助市场机制和企业管理两种手段，紧紧抓住影响畜禽园区产业绿色化的主要因素，构建“协同共生、源头预防、过程监控、末端治理”紧密结合的全新型产业绿色化机制，是实现畜禽园区产业绿色化的重要保障。

(7) 针对我国现行畜禽产业环境政策与现行宏观管理的不足，充分借鉴发达国家畜禽产业绿色化成功经验和做法，推进我国畜禽产业绿色化的对策和建议应主要包括七个方面：①强化农业主管部门在畜禽生产绿色化管理中的主导作用，构建双层畜禽产品绿色标

准体系；②大力推进畜禽产业集群协同共生，提倡“以地定畜、种养结合、零污染当量排放”；③积极采用畜禽清洁生产技术，施行养殖、加工规范化管理；④完善疫病和有害物质检测监防体系，提倡绿色消费、培育绿色市场、开辟绿色通道，强力推进畜禽产品绿色流通；⑤限制畜禽养殖和加工规模，加强畜禽产业污染控制的立法；⑥降低畜禽产业废弃物无害化处理和综合利用的经济门槛，注重建立和完善环境法规政策的绿色导向机制；⑦借鉴工业污染治理的管理经验，加强对规模化养殖加工的环境管理。

总之，实现畜禽园区产业绿色化的关键在于：因地构建一个畜禽生态产业系统，因企建立一套产业绿色化机制，因时配套一组畜禽产业和环境管理政策。

2. 本书的创新之处

（1）国内外虽然有少量的论文对绿色产业的概念、内涵、分类、作用等，以及农业园区的建设和运营进行了定性研究，但对畜禽园区产业如何实施绿色化尚无系统研究，而本书的研究填补了这一方面的空白，将绿色产业研究由目前的宏观研究推进到针对性很强的畜禽园区产业绿色化的中观和微观研究。

（2）利用生态经济学、产业生态学和环境经济学的有关原理，在参考国内外相关研究成果的基础上，界定畜禽产业绿色化的内涵和核心，提出了功能比较完备的畜禽生态产业系统的构成。

以信阳畜禽园区为案例，通过对其生态产业系统发育、产业链主要环节的投入产出和共生网络的物质转化等方面的系统和深入的分析和研究，从食品安全和循环经济的角度，明确了畜禽园区产业绿色化的核心和畜禽园区产业绿色化的关键环节，论证了畜禽园区生态产业系统建立的必要性。

根据目前国内外畜禽产品的绿色标准，通过畜禽园区产业绿色化的经济定性和定量模型分析，从深层次上解释了实现畜禽园区产

业绿色化的企业和政府的行为及其动因。

以当前国内外畜禽产品的食品安全标准为前提,运用产业组织、生态共生、交易费用等理论,结合信阳畜禽园区的实际,探讨并提出了“组织间协同共生、关键点严密监控、企业内清洁生产、废弃物无害化处理、主要资源循环利用”的畜禽园区产业绿色化机制。

(3)通过对国内外畜禽产业的相关政策及实践的研究,从经济、社会、生态环境效益“三赢”的角度,从“畜禽生产绿色化、畜禽产品绿色流通、畜禽产业绿色化的环境管理”三个方面,提出了推进我国畜禽产业绿色化较为系统的一组政策建议。

3. 本研究的不足

因本人水平、时间和精力有限,本书中对国外畜禽产业绿色化政策的分析研究不够深入、系统,在畜禽园区企业共生效益的分析、畜禽产品绿色化标准的经济分析、畜禽园区产业绿色化的评价指标体系等方面还有待于今后继续研究。

关键词: 畜禽园区; 产业绿色化; 环境政策; 食品安全; 废弃物无害化处理

ABSTRACT

In recent decades, livestock industry in China gains rapid progress. As pillar industries in many areas, intensive feeding process in integrated livestock & poultry parks comprises breeding, feedgrains processing, raising, slaughtering, meats processing, storing and transportation, etc. Whereas huge economic losses that jeopardize social stability are incurred by frequent livestock products export failures and bad substances undermining human's health and life security which are results of annual spreading of epidemic diseases, residues of baleful materials and breeding environment deterioration. Meanwhile, many common serious problems stand out, ranging from waste water, animal excrement to polluted air. Therefore, it is of great practical significance to the sustainable development of livestock industry in China to study industry greening and environment policies in livestock & poultry parks.

The industry greening of livestock & poultry parks mainly consists of raw materials greening in livestock production, environment greening in livestock production, raising and processing greening in livestock production, greening of livestock products and safe disposal of wastes. The core part is to provide green livestock products, maintain sustainable utilization of resources and protect environment.

In essence, the first one is to guarantee security of livestock products in parks, and the other one is to realize multi—degree and recycle use of resources, to decrease or eliminate wastes and to dispose those wastes in harm—free way. Firms and farmers as the basic units in those parks are motivated by economic profits. As a result, under the market economy, whether the economic profits of these subjects can be guaranteed or not is determined by incentives essential to the whole industry from both market and government. It is reasonable that any livestock park with only ecological and social benefits can not exist long, not mention stabilized sustainable development.

The industry greening of livestock & poultry parks involves not only health and security of consumers as well as those living near the parks, but also the direct interests of enterprises, farmers and local governments and residents. A game of balancing various benefits of all parts determines to what extent the industry greening of livestock & poultry parks can be realized. So the industry greening of livestock & poultry parks must assure livestock product security and properly cope with the benefits of various parties. Also, aims of increasing profits in livestock & poultry parks are required to stimulate industry greening of livestock and to guarantee economic profits among various stakeholders in livestock & poultry parks. Hence deeper studies on a variety of theoretical issues are worthwhile.

Using principles in eco—economics, industrial ecology, institutional economics and environment economics, this dissertation tries to paraphrase economic mechanisms hidden in the industry greening of livestock & poultry parks from a theoretical perspective. It is also in the position to disclose deep reasons of firms' behavior by virtue of

material-balance theory, appraisal theory of product life circle, input-output analysis, game theory, public policy theory and so forth. It, under the premise of avoiding polluting environment or undermining ecology, makes efforts to build up an ecological industry system with right circulation on an economic-profit-seeking basis. How to construct a brand-new livestock industry greening mechanism which is characteristic of building up coordinated symbiosis patterns, of offering headstream prevention, of monitoring procedure and of offering terminal governing, by virtue of market mechanism and firm management is determined by major factors influencing the industry greening of livestock & poultry parks on the whole. Furthermore, it is necessary to use successful practices and experiences from foreign countries for reference when building these parks. Considering the status of livestock industry in China and the shortcoming in proper environmental policies, a corresponding system of environmental policies, which can provide both constraints and incentives, should be reconstructed. Thus the theme of this dissertation is of vital theoretical significance to directing livestock industry development as well as boosting the process of industry greening of livestock & poultry parks in China.

Using the theory of eco-industry, this dissertation provides a case study performed in Xinyang of Henan Province from the perspective of economics and ecology. By virtue of the successful experiences in ecological industry parks from home & abroad and relative theories such as eco-economics and environmental economics, the dissertation explains the connotation of industry greening of livestock & poultry parks. From the viewpoint of eco-industry in

practice, the dissertation analyses the environmental resources and the livestock industry in Xinyang on the basis of material balances and the hypothesis of product life cycle and input-output models, including harmful residues produced in the industry chain, the impact on livestock environment, the input and output in the industry and so on. The dissertation, based on greening standard regulation of livestock product in China, also discusses greening of livestock product and recycling of wastes, by using data obtained from livestock & poultry parks of Xinyang. From the perspective of economical benefit, it analyses the behaviors of enterprises, explores the deeper reasons and incentives which will affect the operation of greening of livestock industry in China. Then, it puts forward the mechanism of industry greening of livestock & poultry parks on the preconditions of food security standard performed in other countries. By studying the policies and the experiences in the process of the industry greening of livestock in foreign countries, and the experiences of our own, the dissertation puts forward many constructive advices concerning how to promote the process of industry greening of livestock & poultry parks in our country, how to achieve the circular economic development pattern of livestock & poultry parks, and how to conduct the environmental management in the perfection of greening of producing, product and industry of livestock. All of the advices will offer useful reference for upgrading the international competition of our livestock industry, withholding the pollution and decontaminate the rural ecological environment, promoting the sustainable development of livestock industry, and lastly, leading us to a healthy and prosperous way.

1. Some main conclusions

(1) Industry greening of livestock & poultry parks refer to a whole process of reducing pollution in production and processing of livestock industry by making use of green raw materials available in green area or surroundings and by adopting various ecological and technical measures, a whole process of providing healthy livestock products and disposing of wastes in production and consumption which is extremely imperative to enhance environment quality, to protect natural resources and to optimize subsistence circumstances of human being from a sustainable-use-of-resources perspective. The core contains industry greening of livestock products, sustainable resource utilization and harm-free disposal of wastes.

(2) To build up ecological industry system of livestock with proper structure and smooth functions by investing in highly correlated or advanced or highly efficient projects and enterprises, by extending industry chains and by gaining profits in every point with the aid of market mechanism, incentive mechanism and regulation mechanism, all of which mentioned are important carriers in the process of cultivating the ability of coping with risks on market and of facilitating industry greening of livestock & poultry parks. Fundamental drives of improving profit-gaining abilities in livestock industry, absorbing labors, increasing farmers' income and running the whole ecological industry system of livestock are from a variety of factors, including livestock firms' exploration of technology-and-capital intensive breeds, processing and reserve of livestock products, division of labor and collaboration of farmers and the like. These drives are also basal in insuring minimum profits in the livestock industry. Moreo-

ver, integrated industry chains are critical to the development of correlative firms in livestock & poultry parks, guarantee of economic benefits of raisers in parks and the stable development of ecological system of livestock industry.

(3) Eternal drives of hastening industry greening of livestock products are economic benefits under the market economy system. Provision of green livestock products are basic ways of obtaining profits in parks. Wastes collecting as well as comprehensive utilization are crucial in increasing rates of profits and taxes of industry chains. Important premiers of assuring economic profits for firms and exploring markets are establishment of systems of critical entry into domestic markets and institutions of disclosing quality information about products. Under current market and price conditions, animal excrement pollution can, on the whole, be solved by adopting technologies of artificial gathering and disposal of excrement under corresponding institutions of position responsibility and bonus. Due to the fact that much water is needed for the disposing process and technologies of reuse are complex and investment as well as disposal fees are too high and disposed water can not be reused in a proper way, disposal of waste water is the biggest barrier that may overload slaughter firms' burden and may slow down the industry greening process in livestock & poultry parks. So the only way of realizing sustainable development of firms' behaviors and of realizing sustainable use of resources is to improve market mechanism.

(4) In practice, some livestock firms' behaviors are often illegal in wastes disposal because of the situation of gaining low profits, reasons for which are that local environment protection sectors are

forced by the governments, or that firms must undertake responsibilities of disposing wastes, but not that there is collusion between those sectors and firms. In order to solve the problems mentioned above, it is necessary to take comprehensive measures to induct firms to adapt themselves to new patterns of “positive and active” behavior motivation.

(5) Under the situation that livestock industry must develop and firms must be responsible for financial burden or investment forced by market economy, the burden can be divided into several parts, i. e. producers should undertake investment of pollution abatement; consumers should pay for slightly higher prices of products caused by firms' expense on anti-pollution project; governments should undertake supervision responsibility and necessary subsidies or support when they benefit from taxation and financial aid for local economic development; local residents should undertake tolerable environmental pollution when benefiting from public welfare and other advantages.

(6) Realization of industry greening of livestock products depends on enhance of economic effects of both livestock industry and producers as a whole. Hence the building of industry greening mechanism of new type assures the realization of industry greening of livestock & poultry parks by right of developing eco-economics and both market mechanism and enterprise management.

(7) Concerning the shortage of the environmental policies and macro-management of livestock industry in China, referring to the successful experience and methods of livestock industry greening in developed countries, the countermeasures and advices to advance the