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## Executive Summaries

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### **Food Safety and Fear: Factors Affecting Consumer Response to Food Safety Risk**

*Gregory A. Baker*

The question of what constitutes an acceptable risk for food products often pits producers against consumers. The question of why some consumers react strongly to very low probability risks is particularly difficult to answer. In this study, the factors affecting consumers' responses to a very low probability food safety risk are explored. Two thousand consumers were surveyed in mid-2003 regarding how much they would reduce consumption of conventionally grown apples if it were known with certainty that the product posed a risk of one chance in a million of causing cancer. The response rate was 32.0 percent. Responses were analyzed using a logistic regression model to determine the effect of sociodemographic, household role, and psychographic variables.

The results are consistent with a family-oriented response to low probability food safety risks. Women, people in households with young children and primary meal planners were most likely to severely reduce their consumption of the product in response to the low probability risk. It is especially important to understand the factors that influence primary meal planners, since these individuals are key decision-makers in household food choices. Future research should focus on exploring the role of a broader range of factors that might more fully explain consumer response to low probability food safety risks. Such factors should include clues, lifestyles, and opinions, which may reveal the motivations behind consumers' choices.

### **Meeting Private Grades and Standards in Transition Agriculture: Experiences from the Armenian Dairy Industry**

*Jack Cocks, Hamish R. Gow and Daniel J. Dunn*

Due to increased competition in differentiated and branded product markets, private firms are being forced to enact increasingly tighter performance and process grades and standards. These grades and standards requirements have resulted in many small

firms and farmers being excluded from these markets due to necessary investments that participation requires. Thus, this research attempts to provide a framework for analyzing how public and semi-public agencies may be able to facilitate the mobilization and development of sustainable business relationships between small, financially distressed and excluded firms and farmers. Also, this can assist the parties in gaining market access and meeting increasing private grades and standards requirements.

Initially, we discuss the increasing role of private grades and standards in the global agrifood chain. A simple theoretical framework is then developed supporting the role of an external public facilitator in the development of sustainable self-enforcing relationships between financially distressed processors and farmers in situations where private solutions are unattainable. The case of the United States Department of Agriculture Marketing Assistance Project (USDA MAP) in Armenia provides empirical evidence.

The USDA MAP has provided a solution to the dual market failures by acting as an external facilitator between private milk processors and dairy farmers in the initial establishment and ongoing development of milk supply cooperatives. This solves both the processors problems of a reliable supply of consistently high quality milk as well as the farmers problems of market access and timely payment. Thus, through the establishment of a unique and flexibly designed combination of leadership development, training in governance, financial management, dairy management, quality improvement programs, and market assistance, the USDA MAP has assisted the two parties in expanding the self enforcing range of their relationship. Through this they should be capable of sustaining credible long-term exchange relationships once the external agency withdraws. Thereby enabling farmers and firms to credibly contract for the collective marketing of their milk in a sustainable manner.

This case study provides an introductory framework for managers and policy makers in developing countries for understanding and identifying the key elements in the design of organizational structures suitable to support sustainable relationships between business partners where (otherwise due to a lack of suitable external enforcement mechanisms, such as a court of law) they are unable to privately transact. This is important as aid programs have often failed at ensuring sustainability once external management and financial support is removed, due to poor design and understanding of relationship development.

## Food Safety In The Meat Industry: A Regulatory Quagmire

*Peter Goldsmith , Nesve Turan, and Hamish Gow*

Are there multiple approaches to achieve food safety with respect to meat? If so, conceptually what are they and how might they be organized as a framework useful for analysis?

Use the recent meat safety experiences of US and UK food safety to develop a conceptual model of the classes of institutional responses providing consumers with safe food.

A model involving a 2x2 matrix where a food safety mechanism can either be direct/indirect or ex-ante/ex-post. Direct approaches are most common whereby regulatory authorities intervene directly in the food chain to promote safety. Indirect approaches use market-based or legal tools to indirectly incentivize food firms to deliver safety to consumers. Ex-ante mechanisms affect firm behavior prior to production and consumption, while ex-post mechanisms come into play once safety has been compromised. The various model elements are then assessed under the modern phenomena of arduous measurability, non-trivial harm, and acute dynamics to see how the mechanisms perform and deliver safety.

- The results provide a logic that challenges the efficacy of traditional government regulatory approaches and suggest an alternative intervention strategy.
- The precautionary principle is a reasonable approach to food safety in England because the institutional environment differs significantly from the US; exposing consumers to risks not found in the US environment.
- While most look to the regulatory system as being central to food safety delivery in the US, more attention should be given to the role the legal system and product branding play in delivering safety.
- With increasing scale of operation and rate of product innovation in the meat industry more attention should be given to ex-ante mechanisms that get firms to bear risk of a breach in food safety.

## Food Safety And Quality Assurance Key Drivers Of Competitiveness

*Maria Ines Jatib*

Under an institutional and organizational collapsed environment caused by Argentine cracked economical and political situation, farmers and producers are forced to add value through technological innovation designs in order to be competitive at the international market. Food safety and Quality Assurance systems appear as key drivers of competitiveness.

Three emerging models are comparatively analysed, evaluating real agribusiness that are developing HACCP, Quality & Origin Protocol and ISO 9001 Quality Management. As a result, the different level of success and impact of those agribusinesses immersed

in the aforementioned external constraints and no less precarious internal limitations based on cultural, technological and financial limitations are uncertain and variable.

The leading cases described show that building competitiveness is to be accomplished from the process of technological approach, taking into account that Food Safety is a road to Quality Assurance and both are keys to building competitive advantages.

In the internal context, the situation is no less complex since partnerships in the three cases mean collective action based on a common vision and values. The delayed implementation of the proposals is also a consequence of internal organization issues based on the required cultural change. Cultural change may take years but, despite the delays, it is expected that these leading cases will succeed in the long run.

Limitations and restraints are part of the analysis as they emerge from the complex economic scenario and from the precarious strategic alliances in which those agribusinesses are inserted. Poor interrelationships among share holders, ambiguous rules of the game and low commitment have been the emerging facts of that collective action<sup>1</sup>. In this context, it was pretty obvious that different levels of implementation and different impacts on human resources' expected change were to be found.

Particularly, in the HACCP model, the external context changed due to the enhancement of the original requirements as a result of European Union more demanding standards. The HACCP positive impact was that it brought out the complexity and uncertainty of the collective strategy and that it made both shareholders and management and SENASA's inspector review their lack of responsibilities and low commitment. The HACCP system also made evident all the failures -both technological and operative- in the process. Consequently, all partners are now trying to work out those obstacles.

The impact of the self-certification model of "Pampa del Salado" confirmed and made publicly evident that there are contrasting interests at stake, above all, in the many current informal cattle and beef businesses. As this is an ambitious project, representing 0.13 % of the total Argentine cattle business, the proposal of extending the calves of Pampa del Salado to the entire Argentine beef business, will take more time and more farmer involvement. However, the pilot project could help to introduce institutional, organizational, and technological changes in the Argentine beef business. The change of paradigm is not only the farmers' and processors' duty but also the duty of politicians, technicians, and of the other stakeholders involved. Internally, the partners to this collective action will have to keep working on the issues that have already come forward and focus on reinforcing their commitment.

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In spite of ISO 9001 implantation being almost accomplished, the human resource structural change has not yet been reached. It is expected that operative management opposition will dwindle as a consequence of both the natural implantation process and a strong leadership. At the same time, the rest of the workers are making the service more efficient and doing the necessary efforts to achieve client satisfaction. After all of the tackled difficulties, the process is becoming more efficient and effective and the satisfaction of shareholder, employee, management and client expectations that is Quality Assurance -which is one of the company's concerns- is on its way.

Although the leading cases are undergoing institutional and organizational scenarios of external instability and are internally precarious, their essential strength is having a clear goal and well defined objectives. The certainty of going step by step allows both moving forward and expectation of success, all the warnings having been given. By next June 2003, there will be new developments in some of the innovation models discussed. The outcomes thereof will be further discussed at that time.

## Streamlining the Risk Analysis Process and Ensuring The Optimal Organizations For Food Safety: The Case Application To Biotechnology Of *Fusarium* Species

*Darcy Pawlik, Tara Procyshyn, George G. Khachatourians, Peter W. B. Phillips*

Maintaining food safety has been met with great difficulty when dealing with food contaminants such as *Fusarium* species, a fungal pathogen that produces highly toxic metabolites and commonly infests cereal crops allowing it to enter the global food supply chain. The protocols for detection and avoidance are extremely expensive at all stages of food production. However, biotechnology can be used to greatly decrease these costs if the risk analysis process were streamlined to accommodate for specific cases directly related to maintaining a safe food supply chain. Reduced costs to producers, food manufacturers and consumers alike would be experienced if a significant form of resistance were found at the primary production level to *Fusarium* diseases.

This case study illustrates a variety of negative implications associated with various *Fusarium* species throughout the world, constituting serious plant diseases and different forms of animal and human illnesses. The critical nature of the various diseases should demand that action be taken to thwart the disease, however regulatory hurdles impede the potential progress due to the perceptions that biotechnology received since its inception. The article outlines changes to the risk analysis framework, making it more flexible to deal with cases of real risk, rather than speculative possibilities that may result as a consequence of using the tools of biotechnology. The risk analysis framework is critiqued throughout its three principal stages; risk assessment, risk

management and risk communication. The shortcomings of regulatory agencies in risk analysis are countered by an increased roll of communication through all stages of risk analysis and between the various players involved. The goal of increased communication is ultimately consensus formation on issues, rather than argumentative debate that fails to accomplish agenda items and leaves valuable tools like biotechnology impractical to use.

## Product Innovation and Imperfect Competition in the Italian Fruit-Drink Industry

*Carlo Russo, Concetta Cardillo, Maria Angela Perito*

In this paper, the case of Italian fruit drink industry is presented to address the strategic issues of product innovation in non-perfectly competitive markets. In particular, the determinants of innovation and the role of vertical coordination have been discussed. The Italian fruit drink industry has been showing a remarkable increase in the number of new products marketed each year; the objective of the paper is to investigate the causes of the industry conduct and to develop a basic economic model to analyze the decision process for investment in innovation.

In the study a brief industry strategic analysis, a marketing channel analysis and a conceptual framework are proposed. In the Italian fruit drink industry, innovation is the key to compete successfully in a high concentrated and growing market. Data shows that new products are boosting the sales of the whole industry and producers are profiting from the consumers' demand for health and nutritional attributes in food. A basic model is developed to describe competitors' innovation strategies. The model is based on game theory and a real option approach is applied to define competitors' payoff function and to account for managerial flexibility.

The analysis supports the conclusions that although innovation in Italian fruit-drink industry is a demand pulled process, the shift in consumer preferences alone cannot explain the current trend in the industry. Other factors contribute to the high rate of innovation in the industry. In particular:

1. The increase in retailers' efficiency, due to the concentration process during the '90s. The more efficient retail system (i) imposes a screening process preventing unsuccessful innovation from gaining access to the market, (ii) promotes a more effective information flow, (iii) allows producers to manage effectively in-store promotions (iv) facilitate the logistic of innovation. As a result, the probability of innovation failure is lower and the cost of unsuccessful products is lower.
2. Price competition on "non-innovative" goods. Price pressure provides incentives to product differentiation.

3. Imperfect competition, which gives incentives to accelerate the innovation rate in order to gain extra-profits from and pre-empt competitors.
4. Relatively low R&D costs for innovation and low cost for failure mitigating the effect of the uncertainty in innovation-based strategies.
5. Economies of scale and scope and production flexibility allowing major producers (i) to achieve cost advantage and (ii) to hedge the risk of innovation through diversification (iii) to adopt brand advertising, reducing the marginal costs of an additional innovation considerably.

Although consumers' demand can be considered as a necessary factor for successful innovation, it may not be sufficient. Innovation is a risky strategies and a careful evaluation of potential profits and losses is required. The findings of the study suggest that risk management can be a key issue for successful innovation-based strategies. Also, vertical coordination and information management have been relevant determinants in the innovation wave in the Italian fruit drink industry.

## Innovation through (International) Food Supply Chain Development: A Research Agenda

*Jacques H. Trienekens, James M. Hagen, Adrie J. M. Beulens and S.W.F. (Onno) Omta*

The Western consumer has become increasingly concerned about the quality and safety of food. At the same time global sourcing programs of retailers and food industries lead to food chain development between western and developing countries and also to chain development in developing countries. For developing countries the challenge is to comply with the quality and safety demands of their western customers and to become equal partners in these international food chains. An important question related to these developments is how international food chain development can contribute to (social-economic) innovation processes in developing countries.

This paper presents a research agenda on innovation through (international) food supply chains and networks in developing countries. It derives major topics from a multi-perspective view on international food chains (including economic, technology, social/legal and environment aspects) and from different theoretical streams dealing with chains and networks (Supply Chain Management, Industrial Organisation theory and Network Theory).

Three agri-supply chain projects in developing countries (Thailand, South-Africa, Ghana) are analysed to identify focus areas in supply chain development projects and important gaps. These projects were collaborative actions between companies and research institutes to initiate international supply chain development.

Attention in our three cases is focused on market, quality and logistics issues, while less attention is given to issues related to regional and sustainable social-economic development and environmental issues. If sustainable socio-economic development is to be achieved we believe that also attention must be paid to these issues.

In general, businesses have a commercial interest in international supply chain development, which means that their attention will be focused on economic and related technological issues. Some companies, however, are starting with programmes that have a broader perspective. An example is the Ghana case presented in this paper.