

Developing Functional Food Products from Plant Biotechnologies

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Progress Report (covers period of 8/1/06-6/30/08)

Project Overview

In the last decade the nutraceutical market has grown alongside trends of higher consumer income levels, an expanding elderly population and the enhanced awareness about health and nutrition. While nutraceuticals have historically emerged from the identification of plants with existing health benefits, the biotech industry is beginning to take the nutraceutical concept to the next level by engineering specific functionality in plants. Missouri's considerable agricultural and biotechnical expertise in this area positions it for this upcoming opportunity. Accordingly, this project proposes to help develop an existing/emerging company as they navigate the commercialization phase of their nutraceutical product. This project will create detailed supporting materials (e.g. market analysis, supply chain design, etc.) and plan of action for a case study company. It is believed this material will be an instructive template for successive companies and state stakeholders hoping to understand what is needed to successfully develop the nascent industry.

Progress

Product Market

Research on the project began with an analysis of the product's market, including:

- Identifying the list of nutraceuticals that have even cursory relevance to the case product.
- Identifying prescription and over-the-counter drugs that are relevant to the case product.
- Approximating a unit price of the product based on competing products, the convenience of delivery, expected efficacy and an initial estimation of production cost/pricing.
- Identifying some scenarios of potential market size for the case product based on varying functionality and price.
- Calculating a total market value for the product based on the above.

Production Costs and Supply Chain Design

We use the above market size information to forecast the total farm production area needed, as well as, the needed processing facility capacity. Given expected product yields and average field size we can identify how many producers will be needed to produce the specialty crop, and thus, how the supply chain might be coordinated. One option being considered is the cost (i.e. tax) advantage of operating the processing plant as a farmer cooperative, as opposed to operating it

under the ownership of the principle. Inherent to this issue is determining how incentives could be equitably coordinated between the two parties.

A supply chain model is being developed and tailored to the nutraceutical industry to further detail the economic relationship between the seed producer, the farmer, and the processor/owner. This model will allow various supply chain arrangements to be tested and the resulting costs/benefits for each party to be analyzed. While the model is still being constructed, to date work is being done on the costs of contracting and segregation of the specialty crops between the farmer and the processor.

Another issue currently being integrated into the supply chain model is production risk. This includes the ramifications of farmer-processor contracts that stipulate acreage as opposed to bushel quotas. Paralleling this issue we are addressing the value of diversifying risk by utilizing multiple production geographies and how that decision is impacted by contract choice, end product value and inability to correctly forecast product demand.