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Doing Well by Doing Good in the Fight against Malnutrition and Hunger

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Cornhusker Economics

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Market Report	Year Ago	4 Wks Ago	10-5-18
Livestock and Products,			
Weekly Average			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight.	109.50	*	*
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.	201.88	169.69	183.29
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.	167.78	163.74	163.41
Choice Boxed Beef, 600-750 lb. Carcass.	197.39	209.13	204.30
Western Corn Belt Base Hog Price Carcass, Negotiated	54.51	45.05	63.34
Pork Carcass Cutout, 185 lb. Carcass 51-52% Lean.	72.15	66.84	78.25
Slaughter Lambs, woolled and shorn, 135-165 lb. National.	155.75	134.10	136.32
National Carcass Lamb Cutout FOB.	398.02	377.15	381.63
Crops,			
Daily Spot Prices			
Wheat, No. 1, H.W. Imperial, bu.	3.15	4.63	4.61
Corn, No. 2, Yellow Columbus , bu.	3.06	3.31	3.29
Soybeans, No. 1, Yellow Columbus , bu.	8.82	7.29	7.42
Grain Sorghum, No.2, Yellow Dorchester, cwt.	5.45	5.13	5.23
Oats, No. 2, Heavy Minneapolis, Mn, bu.	2.92	2.93	3.11
Feed			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	*	185.00	*
Alfalfa, Large Rounds, Good Platte Valley, ton.	85.00	102.50	102.50
Grass Hay, Large Rounds, Good Nebraska, ton.	87.50	102.50	87.50
Dried Distillers Grains, 10% Moisture Nebraska Average.	115.50	136.50	135.00
Wet Distillers Grains, 65-70% Moisture Nebraska Average.	42.50	44.00	48.50
* No Market			

Technological innovation and the conduct of innovating firms are key weapons in the fight against hunger and the pursuit of food security around the world. Agricultural biotechnology seems uniquely equipped, if not destined, to spearhead the effort to combat malnutrition and hunger around the world by conferring significant agronomic benefits to producers and by having the ability to enhance both the resistance of plants to environmental stresses and the quality and nutritional value of food. Research that was recently published by the Center of Agricultural and Food Industrial Organization-Policy Research Group at the University of Nebraska Lincoln analyzes the conduct of innovating firms in hunger-stricken countries where, based on the Food and Agricultural Organization of the United Nations, more than 800 million people have been facing malnutrition and hunger.

Recognizing that malnutrition and hunger can be reduced through access to increased quantities of nutritious food offered at affordable prices, the research analyzes the output/pricing strategies of innovating agri-food companies in hunger-stricken areas of the world. To do so, the research develops an empirically relevant multi-market framework of heterogeneous consumers and an imperfectly competitive innovating firm that seeks to maximize profits. To analyze the profit-maximizing strategies of the innovating firm in different regions of the world, the research considers the innovating firm's behavior in two regions – a hunger-stricken country/region (HSC) that can benefit from genetically modified (GM) technology developed by the innovating firm, and the rest of the world where the innovation is marketed.

While most of the literature on innovator strategies regarding the management of intellectual property

rights (IPRs) assumes that innovators desire the exercise of market power conferred by their IPRs (and the subsequent innovation rents that their monopoly position over their innovation confers), a key result of this study is that there could be cases that the innovating firms find it economically optimal to offer their innovation to HSCs for free. Intriguingly, this result holds even when the innovation is purely rival and it is consistent with observed innovating firm behavior, like Monsanto's recent donation of its DroughtGard™ tolerant maize technology to Water Efficient Maize for Africa a private-public partnership aimed at developing maize varieties tolerant to drought for certain African countries.

Specifically, the analysis shows that under standard assumptions about the relationship between the hunger-stricken country/region and the rest of the world, the profit-maximizing innovating firm finds it optimal to price discriminate and exercise its market power in each region. The optimal strategy of the innovating firm changes, however, when its GM technology can increase the supply of, and consumer access to nutritious food in hunger-stricken areas of the world, and consumers in the rest of the world care about this technology-enabled reduction in malnutrition and hunger. Recent poll and survey findings suggest that consumers in developed countries express greater support for genetic engineering when the benefits it can confer as a solution to global food shortages or extreme weather conditions become salient.

To the extent that the association of the GM technology with malnutrition and hunger reduction in food-insecure areas of the world can lessen the consumer aversion to the GM technology in the rest of the world, it will also change the profit-maximizing strategy of the innovating firm. In particular, when the increased consumer access to nutritious food in hunger-stricken areas reduces consumer aversion towards the GM technology in the rest of the world, the innovating firm will find it optimal to reduce its price and increase the adoption of its technology and the subsequent consumer access to nutritious food in these hunger-stricken areas. The greater the benefits the firm realizes due to the increased goodwill in the rest of the world, the greater the reduction in its price in the hunger-stricken areas. When the innovator's benefits from the reduced consumer aversion to GM technology are relatively high (i.e., when they exceed the losses due to reduced prices in the hunger-stricken areas for all relevant prices), the firm will find it optimal to offer its GM technology in the hunger-stricken areas for free. Such a strategy increases the adoption of technology and consumer access to nutritious food in the hunger-stricken areas and, through this, it enhances the firm's goodwill and the benefits it enjoys in the rest of the world. For the benefits from the firm's prosocial business practices to be maximized, it is important that the impact

of the GM technology in hunger-stricken areas of the world is broadly and effectively communicated.

Given the conflict of interest, the innovating firm should probably not be the sole (or even the main) source of this information. Instead, trusted third parties with an interest in such humanitarian endeavors need to be identified and utilized to communicate the benefits of the technology to the public. This is particularly important for places like the European Union where the very strong (and, quite often, very vocal) consumer opposition to GM technologies has shaped both the adoption of the technology as well as its regulatory treatment in the continent and beyond. The identification of trusted information sources and the development of properly designed messages can maximize the consumption externality/goodwill of the innovating firm and, with it, the benefits of the strategy analyzed in this study.

Of course, a necessary condition for these benefits to be realized is allowing the entry of relevant GM innovations into the markets of interest. Such an entry would, in many cases, necessitate the careful revision/easement of regulatory requirements that have been acting as barriers to entry and commercialization of important hunger-reducing GM technologies. The development of technologies that offer solutions to food-related challenges and their donation or provision at low prices to hunger-stricken areas of the world can increase goodwill towards GM technologies and lead to the regulatory changes that are necessary for their adoption.

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