THE ECONOMIC IMPACT OF THE NEW SORGHUM CULTIVARS FOR DAIRY PRODUCTION IN NICARAGUA

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The investment in improved sorghum cultivars for dairy production has large potential economic benefits. Dairy farmers are more willing to adopt sophisticated technology (US$ /Ton) for improved sorghum cultivars developed to respond the farmers' need for more efficient alternatives to feed dairy cows and to increase milk yields in Nicaragua.

**INTRODUCTION**

- Economic growth leads to qualitative improvements in consumers' diet. High protein food demand such as milk grows rapidly in developing countries.
- Dairy producers need to increase production to meet the growth of milk demand and rise yields per cow by adopting new technologies.
- Public sector in Nicaragua has invested in agricultural research to produce new technologies that will allow dairy farms to increase their productivity.
- Improved sorghum cultivars were developed to respond the farmers’ need for more efficient alternatives to feed dairy cows and to rise milk yields in Nicaragua.

**RESEARCH QUESTIONS**

- The new sorghum cultivars have shorter growing periods and higher grain and forage yields per hectare than the traditional cultivars.
- The new cultivars are also more tolerant to drought and sorghum diseases than their predecessors.
- Farmers can take advantage of forage multiple cuts feature in a number of the new sorghum which provides an important advantage over maize crops.

**FARM COST SAVINGS**

- We estimated the cost savings at farm level by comparing the feeding cost per liter of milk produced in farms with and without the new sorghum technology within small, medium, and large dairy farms. Producers were classified by number of lactating cows.
- Data of herd size, feed cost, milk yields per cow, farm technology, sorghum area and grain uses was collected using questionnaires at 120 dairy farms in Pacific coast plains of Nicaragua. R&D costs were estimated from public expenditure data.

**RESULTS AND DISCUSSION**

The economic surplus analysis of the new sorghum cultivars in dairy production suggests the following:

- The investment in improved sorghum cultivars for dairy production has an IRR of 20%. The opportunity cost of Nicaraguan public funds.
- Agricultural research projects are very important for consumers since they are the main beneficiaries from the shift of milk supply.
- Large dairy farms are more willing to adapt more sophisticated technology and obtain higher benefits than small and medium dairy farms.
- Milk price increase will create more incentives for producers to rapidly shift to more intensive systems of milk production.
- In making this public decision it is important to remember that consumers are expected to be the major beneficiaries of the expansion of the dairy production.
- This study can be extended by incorporating the benefits in the grain market.

**ECONOMIC IMPACT MODEL**

The economic surplus method was used to estimate the benefits and evaluate the distribution of surpluses between consumers and producers.

- The model calculates the stream of benefits for consumers, producers, and retailers in the Nicaraguan dairy market for the period 1985 to 2010.
- The economic benefit due to the adoption of a cost-saving technology was calculated using the following equations adapted from Freebairn et al. (1982):