INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI

PROJECT NOTE | APRIL 2017

INCENTIVES AND SUBSIDIES FOR FARMER ADOPTION OF FOOD SAFETY TECHNOLOGIES

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Unsafe food is a major cause of disease in developing countries, accounting for an estimated 2 million deaths per year globally and comprising a burden of illness comparable to that of malaria or tuberculosis (WHO, 2015). Reducing the risk of foodborne disease typically requires improvements in food production, processing, and handling practices from farm to fork. However, inducing these changes in the absence of effective regulatory enforcement is challenging because food safety is unobservable and is generally not rewarded by higher prices in markets. In Kenya, a prominent public health concern is contamination of maize, a major staple crop, with the fungal byproduct *aflatoxin*.

STUDY DESIGN

IFPRI researchers conducted a randomized controlled trial in 30 villages of Meru and Tharaka-Nithi counties in Kenya to test the impact of two approaches to encourage smallholder maize farmers to adopt aflatoxin control practices: subsidies for aflatoxin control technologies and market incentives for maize that was found to be aflatoxin-safe. A total of 350 farmers in 15 in villages assigned to receive the intervention were given training on aflatoxin control, free plastic sheets for sun-drying their maize, access to a mobile maize drying service that used a beta version of the EasyDry M500 Dryer[1], and hermetic storage bags. Each of these technologies are recommended for aflatoxin control.

The prices at which farmers were able to use the dryer or purchase bags were randomly varied within each village. Prices included free access, 150 ($1.50 US) Ksh per 90 KG bag, and 350 Ksh ($3.50 US) per bag. Since no mobile drying service was available in the market at the time of the study, these prices were calculated to reflect the expected full commercial cost of mobile drying service provision, a rate to cover only operating costs (but excluding the capital cost of the dryer), and a free public provision model. Farmers in 15 other villages in the same region were provided basic training on aflatoxin control, but were not provided access to control technologies until after the study was complete.

In addition, 50 percent of farmers within the intervention villages were offered the opportunity to receive a bonus payment of 15 Ksh/KG (approximately 15 cents US) over the market price for up to 45 KG of aflatoxin-safe maize two to three months after harvest.

Training was held in intervention villages prior to the February 2015 harvest, and mobile dryers and hermetic bags were made available immediately after harvest. All participants in intervention villages were reminded of the dryer service through phone calls and were offered transportation for themselves and their maize to a central location where the dryer was set up. Because farmers were only allowed to purchase hermetic bags if their maize was sufficiently dry, the primary outcome tracked through the study was demand for the maize drying service.

RESULTS

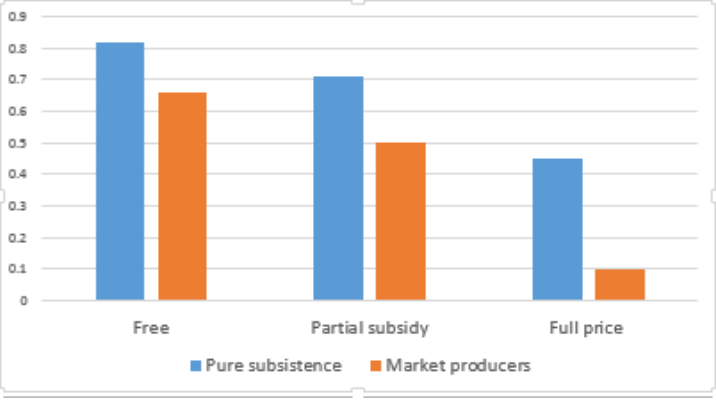
The proportions of famers who brought maize to the mobile dryer, by price and market engagement prior to the study, are shown in Figure 1. These proportions include the 236 farmers who expected to harvest at least 45 KG at the time of the training meeting, the minimum maize required for dryer use.

Farmers who grew maize for sale were significantly less likely to bring their maize to the mobile dryer than those who produced solely for their family's needs. Demand for the drying service was very high among subsistence producers at both the partially and the fully subsidized rates, but fell to less than half when the full expected commercial price of the service, equivalent to 12-20 percent of the price of maize (depending on market conditions), was charged.

[1] http://www.acdivoca.org/wp-content/uploads/2017/03/AflaSTOP-Innovations-in-Drying-Brief_finalA4.pdf

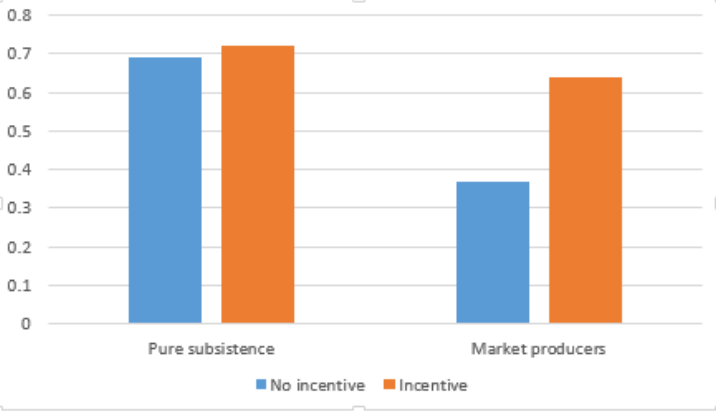
An important caveat to the interpretation of these results is that the high level of demand for aflatoxin control technologies observed in this study may not be representative of Kenyan farmers generally. Training on aflatoxin and its prevention, reminders to use the maize drying service, and transportation to the dryer all served to remove non-monetary barriers to use in order to observe more clearly the impacts of subsidies and price incentives

Figure 1. Demand for drying service by market orientation and price



As shown in Figure 2, market producers who were offered the food safety price incentive were significantly more likely to use the drying service than market producers who were not offered the incentive. However, those producing solely for subsistence were no more likely to adopt the food safety technology when offered a price incentive.

Figure 2. Demand for drying service by market orientation and food safety price premium



CONCLUSIONS

Study results suggest that while farmers in this setting are strongly motivated to improve food safety practices out of concern for their family's health, this motivation is weaker when a portion of their produce is sold. On the other hand, price incentives for safe maize are a powerful motivator for farmers engaged in production for the market, but have no impact on those who grow solely for subsistence. Subsidies for aflatoxin control technologies result in high rates of use among subsistence farmers, but are less effective for market-oriented producers.

These findings suggest that a two-pronged approach is required to address food safety in contexts where both subsistence agriculture and production for the market are common. By combining targeted subsidies for the portion of food consumed by farm families with premium prices for produce which is sold, farmers' incentives and capacity to provide safe food can be aligned with public health goals.

ACKNOWLEDGEMENTS

This work was funded by the Ministry for Foreign Affairs of Finland and the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH). Aflatoxin testing platform and technical assistance were donated by Mobile Assay (www.mobileassay.com) as part of a Bill and Melinda Gates Grand Challenge Explorations Award (OPP1112728) entitled "Lab-on-Mobile Device Platform for Mobile Diagnostics and Pathogen Surveillance".

CITED SOURCE

WHO (2015) "WHO estimates of the global burden of foodborne diseases". Available online: http://www.who.int/foodsafety/areas_work/foodborne-diseases/ferg/en/

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