Potential Demand for a New Value-Added Cowpea Product as Measured by the Willingness-to-Pay for Cowpea Flour in West Africa

Miriam Otoo
Department of Agricultural Economics, Purdue University,
403 W. State Street, West Lafayette, IN 47907, USA.
Email: motoo@purdue.edu

Joan Fulton
Department of Agricultural Economics, Purdue University,
403 W. State Street, West Lafayette, IN 47907, USA.
Email: fultonj@purdue.edu

Germaine Ibro
Institut National de Recherche Agronomique du Niger (INRAN), Niamey, Niger.
Email: geribro@yahoo.fr

*Poster prepared for presentation at the Agricultural & Applied Economics Association 2010
AAEA, CAES & WAEA Joint Annual Meeting, Denver, Colorado, July 25-27, 2010*

Copyright 2010 by Miriam Otoo, Joan Fulton and Germaine Ibro. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.
BACKGROUND AND PROBLEM

Value-added processing of cowpeas into street foods (such as kossaï) is important in alleviating poverty and food insecurity in West Africa because:

1. Provides income for women street vendors and their families (Tinkler, 1997).
2. Supplies inexpensive and nutritional foods for the urban poor who often can only afford to buy small quantities of food at a time (IFPRI, 2006).
3. Promotes domestic agriculture (Ibro et al. 2006).

Processing of kossaï is labor-intensive creating challenges for the women vendors. Cowpea flour can increase efficiency for the kossaï vendors by reducing labor and uncertainty. Commercialization of cowpea flour requires knowledge of potential and real market size.

Previous research identified that vendors' stated willingness to pay for cowpea flour exceeded the cost of the cowpea input (Ibro et al. 2008).

DATA

- Primary data from staged transactions
- Real market exchanges of cowpea flour
- December 2003 in Niamey, Niger
- 60 kossaï vendors selected via stratified random sample
- Specific data collected included:
  - WTP for cowpea flour
  - Vendors' personal characteristics
  - Vendors' business characteristics
  - Production constraints

METHODOLOGY

Researchers assess consumer demand for new products with:

1. Stated preference methods (Lusk et al. 2006, Kimenju and Grontved, 2003) based on hypothetical settings and intended behavior. These may not be incentive compatible and may overestimate consumer demand.
2. Non-hypothetical preference-revealing methods (Silva et al. 2007).

Real purchase decision mechanisms and experimental auctions are incentive compatible as individuals' dominant strategies are truthfully revealed.

Experiment Design:

- Non-hypothetical real purchase decision mechanism – real purchase exchanges of 1 kg. packages of cowpea flour in a real market environment.
- Price was determined by active negotiation in the market place between an upper and lower bound price
  \[ P = P_1 + P_2 \]
- Final price of the exchange is a true Willingness to Pay.

Theoretical framework of the real-purchase decision mechanism:

- Women street food vendors are rational utility maximizing consumers. Demand can be derived from the indirect utility function.
- \[ WTP = f(x) \] where \( x \) is the vector of explanatory variables.
- The sample is truncated by the upper and lower bound prices.
- The derived log-likelihood function of the two-limit truncated regression model is defined as (Greene, 2008):
  \[ L = \sum \left[ \ln \left( \frac{1}{\sigma} \right) - \ln \left( \Omega^{-1} \right) \right] - \ln \left( \frac{1}{\sigma} \right) - \ln \left( \Omega^{-1} \right) \]

RESULTS

- We used a Likelihood Ratio (LR) test to determine the best linear trend line for significant differences in the exchange WTP of the groups.
- For differences in WTP, statistically significant between low and high income neighborhoods: low and middle income neighborhoods and between the pooled high and low income neighborhoods.
- Vendors using wet-milled processing had a higher WTP (and statistically significant) compared to vendors using dry-milled processing.
- Large scale vendors had a higher WTP (and statistically significant) compared to small scale vendors.
- Medium scale vendors had a higher WTP (and statistically significant) compared to small scale vendors.

CONCLUSIONS

WTP values determined from real market transactions provided consistent results with WTP values determined from stated preference methods in previous research.

Vendors are willing to pay a premium for cowpea flour that, on average, more than covers the cost of production plus retail margin.