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Grain legume cultivation and children's dietary diversity in smallholder farming households in rural Ghana and Kenya

Ilse de Jager[1,2], Abdul-Razak Abizari[3], Jacob C. Douma[4] , Ken E. Giller[2], Inge D. Brouwer[1]

[1] Division of Human Nutrition. Wageningen University and Research. The Netherlands. [2] Plant Production Systems group. Wageningen University and Research. The Netherlands. [3] Department of Community Nutrition. University for Development Studies. Ghana. [4] Centre for Crop Systems Analysis group. Wageningen University and Research. The Netherlands.

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Background and Objectives

Boosting smallholder food production can potentially improve children's nutrition in rural Sub-Saharan Africa. This study used a convergent parallel mixed method design to assess:

- The potential of increased household legume production to improve children's dietary diversity
- The direction, strength and relative importance of
  - the production-own consumption pathway
  - the income-food purchase pathway

Methods

Within the framework of a large agricultural development project supporting legume production (N2Africa), we conducted:

quantitatively → **A cross-sectional quasi-experiment**, comparing households that do or do not participate in N2Africa
- Households legume production
- Monthly legume consumption
- Dietary diversity (24-hr recalls)

quantitatively → **Structural Equation modelling (SEM)**

qualitatively → **Focus group discussion**

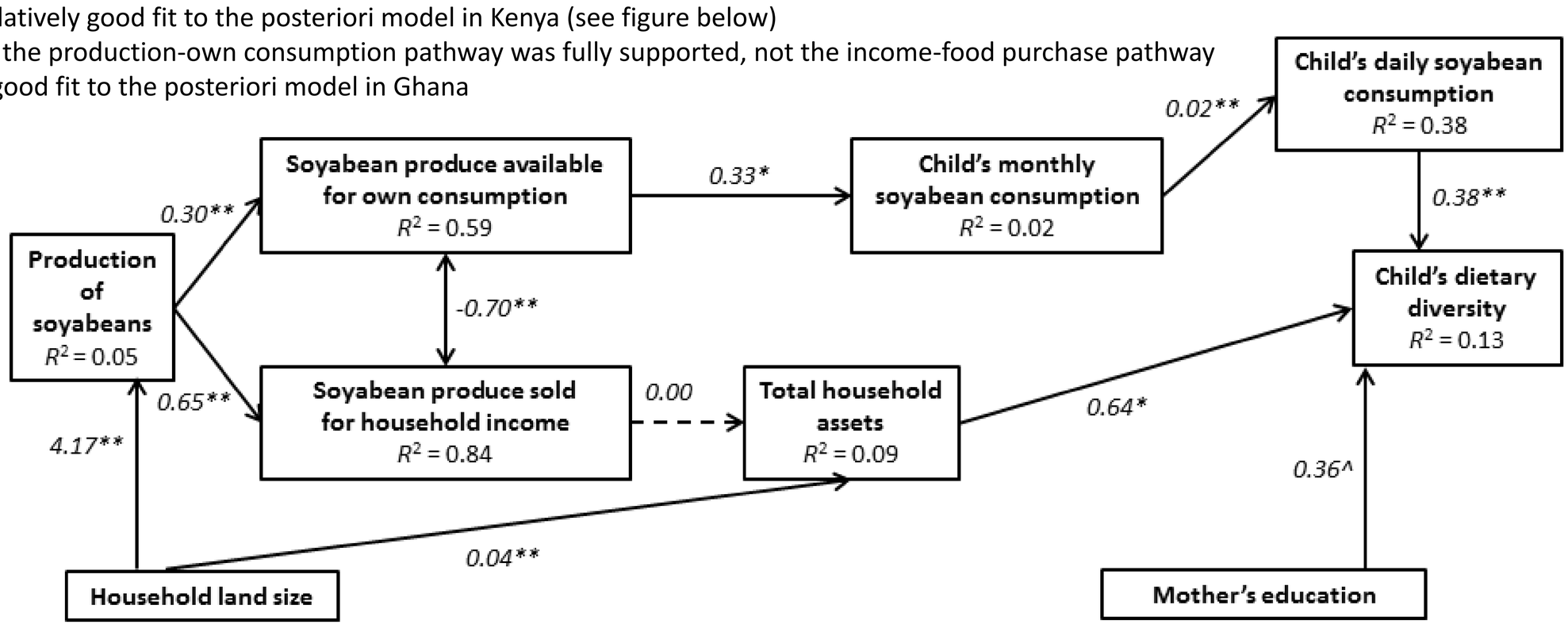
Results

N2Africa households vs non-N2Africa households
- No differences in children's, mother's and households characteristics
- No differences in total legume production
  - % used for consumption is lower in N2Africa group in Ghana
- No differences in children's dietary diversity
  - % children consuming legume food group is higher in N2Africa group in Ghana

	Ghana		Kenya	
	Non-N2Africa (n=202)	N2Africa (n=129)	Non-N2Africa (n=154)	N2Africa (n=186)
Children's dietary diversity [1]	4.1 (1.4)	4.2 (1.3)	4.2 (0.9)	4.2 (1.0)
Legumes food group[2], %	77.2	86.8*	40.3	42.5

[1]Individual dietary diversity score (IDDS) of children 6-59 months old based on 7 food groups, 0 to 7 (mean (SD)). [2]% of children 6-59 months who consumed legumes, nuts and/or seeds. *P<0.05 (comparing N2Africa and non-N2Africa)

For soybean, explorative structural equation modelling indicated
- A relatively good fit to the posteriori model in Kenya (see figure below)
  - the production-own consumption pathway was fully supported, not the income-food purchase pathway
- No good fit to the posteriori model in Ghana



Explorative structural equation model of the Effect of soybean production on dietary diversity of children 6-59 months in rural Western Kenya (n=197). X^2(df) = 22.59 (24), P=0.64 (corrected with Bollen-stine bootstrap). Values are unstandardized regression coefficients (^P<0.10, *P<0.05, **P<0.01, path coefficients not significantly different from zero are shown by broken lines). Value between error terms of soybean yield available for own consumption and for household income is the estimated correlation. Part of the variance explained by the model (R^2) is given under the variable names.

Results are possibly related to food environment differences between Ghana and Kenya
- attribution of positive characteristics to soybean
- the variety of local soybean-based dishes
- being a new crop or not
- women's involvement in soybean cultivation
- the presence of markets
- being treated as a food or cash crop

Conclusions

These findings confirm the Importance of the food environment for translation of enhanced crop production into improved human nutrition. This study shows that in a situation where rigorous study designs cannot be implemented, SEM is a useful option (in addition to other complementary methods) to analyse whether agriculture projects have the potential to improve nutrition.

Reference

de Jager, I., Abizari, A., Douma, J. C., Giller, K. E., & Brouwer, I. D. (2017). Grain legume cultivation and children's dietary diversity in smallholder farming households in rural Ghana and Kenya. *Food Security, published online*.

Keywords

Dietary diversity, legume production, SEM analysis, children, Ghana, Kenya.

No conflict of interest