

REVIEWER'S REPORT

Manuscript No.: IJAR-59257

Title: Production, distribution et utilisation des farines infantiles dans la region des savanes (Togo)

: Analyse integree de la chaîne de valeur et determinants de leur adoption par les ménages.

Recommendation:

Accept as it is

Accept after minor revision.....

Accept after major revision ...YES.....

Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✓		
Clarity		✓		
Significance		✓		

Reviewer's ID: JPR-094

Detailed Reviewer's Report

Reviewer's Report

1. Strengths

- Relevant public-health topic:** The study addresses infant complementary feeding and the availability/adoption of locally produced infant flours, which is important for child nutrition in the Savanes region of Togo.
- Integrated approach:** The manuscript attempts to examine the production, distribution, and household utilization of infant flours rather than focusing on only one part of the value chain.
- Multiple stakeholder groups:** Data were collected from production units, distributors, and 152 households, providing information from different levels of the supply and demand chain.
- Use of statistical analysis:** The authors employ descriptive statistics, ANOVA, Spearman correlation, bivariate analysis, and Firth penalized logistic regression.
- Attempt to address small-sample problems:** The use of Firth logistic regression is methodologically appropriate in principle when there are small samples or separation problems.
- Practical findings:** The observation that local products predominate among distributors and that household size is associated with reported use provides potentially useful information for nutrition-program planning.

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7. **Discussion connects findings with previous literature:** The manuscript attempts to place the findings within the broader West African complementary-feeding literature.

2. Weaknesses / Major Concerns

1. **Very small sample of producers and distributors.** Only 6 production units and 9 distributors were included. This severely limits statistical inference and generalizability.
2. **Sampling methodology needs clarification.** Purposive sampling was used for producers and distributors, but the manuscript does not adequately explain how the 152 households were selected or whether the household sample is representative of the region.
3. **Potential inconsistency in the number of producers.** The text states “cinq (06) producteurs,” which is internally inconsistent and should be corrected.
4. **Definition of the primary outcome needs improvement.** “Use” of infant flour is defined simply as Yes/No. The manuscript should specify the recall period, frequency, quantity, age of the child, and whether current or previous use was measured.
5. **Potentially serious model-overfitting.** The multivariable model contains a very large number of predictors relative to 152 observations, while the number of non-users appears to be only 14. This requires substantial justification even though Firth regression was used. The manuscript should report the model-building strategy and assess model stability.
6. **The extremely high AUC (0.958) should be interpreted cautiously.** The reported AUC is based on the same dataset used to fit the model and apparently lacks internal or external validation. Therefore, it should not be described as demonstrating “excellent” predictive performance without qualification.
7. **The interpretation of the household-size coefficient requires clarification.** The coefficient $\beta = -6.511$ and $OR = 0.001$ are extremely large in magnitude. The manuscript itself mentions a possible transformation of household size, but the exact transformation must be explicitly stated and justified.
8. **Some conclusions are stronger than the design permits.** This is a cross-sectional study; therefore, associations should not be presented as causal determinants.
9. **Economic variables appear insufficiently investigated.** The discussion emphasizes price, affordability, income, and accessibility, but these variables do not appear adequately measured in the reported household analysis.

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10. **Nutritional quality is not directly assessed.** Since the paper concerns infant flours, information on nutritional composition, fortification, microbiological safety, labeling, shelf life, and compliance with relevant standards would substantially strengthen the value-chain assessment.
11. **Several statements are speculative.** For example, differences in production are attributed to mechanization, access to equipment, markets, and investment, but these factors were not apparently measured directly.
12. **Tables require careful checking.** Some table formatting and terminology are unclear, including the presentation of product categories and some French terminology. The statistical notation and decimal formatting should be standardized.
13. **Ethical approval information is incomplete.** The manuscript states that ethical principles and informed consent were followed, but does not provide the name of the ethics committee, approval number, or approval date.
14. **Language and editorial problems are present.** There are numerous spacing, punctuation, typographical, and grammatical errors, such as “GraphPadPrism,” “Firth'sPenalizedLikelihoodLogisticRegression,” and several words joined together. The manuscript requires thorough language editing.

3. Key Points Requiring Revision

- Clarify the sampling frame and recruitment procedure for all three participant groups.
- Correct the inconsistency concerning the number of producers.
- Clearly define the primary outcome and its measurement period.
- Provide complete information about the statistical model, variable-selection procedure, coding and transformation of household size.
- Reconsider the number of predictors in relation to the number of outcome events.
- Provide confidence intervals and preferably sensitivity/internal-validation analyses for the logistic model.
- Temper the interpretation of the AUC of 0.958 because it appears to be an apparent, in-sample performance measure.
- Distinguish **association** from **causation** throughout the manuscript.
- Add socioeconomic, affordability, accessibility, and product-related variables if available.
- Provide details of ethical committee approval.
- Improve tables, figures, statistical notation, and French/English language quality.

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- Strengthen the limitations section, particularly concerning sample size, purposive sampling, cross-sectional design, self-reported utilization, and generalizability.

4. Significance of the Study

The study has **potential scientific and public-health significance** because it examines a relatively under-investigated component of complementary feeding in the Savanes region and combines supply-side and household-level information. The finding that locally produced flours constitute the predominant products among surveyed distributors and the exploration of household-level factors could be useful for future nutrition and food-system interventions.

However, the **small number of production units/distributors and methodological limitations substantially restrict the strength and generalizability of the conclusions**. The paper would be more valuable if the statistical methodology and interpretation were substantially strengthened.

5. Recommendation

Recommendation: Major Revision

The manuscript addresses an important and potentially publishable topic, but **major methodological, statistical, presentation, and interpretation issues should be addressed before it can be considered for publication**. In particular, the authors should carefully revise the multivariable analysis, justify the model specification, clarify sampling and outcome measurement, and moderate conclusions that may imply causality or broad generalizability.

Overall reviewer assessment:

- **Originality:** Good
- **Scientific/Technical quality:** Fair to Good
- **Methodological rigor:** Fair
- **Statistical analysis:** Requires major revision
- **Significance:** Good
- **Presentation/Language:** Fair
- **Recommendation:** Major Revision

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- Based on the manuscript, **“Major Revision”** is justified because several methodological and statistical issues affect the reliability and interpretation of the main conclusions. Below is a line-by-line reviewer justification that you can directly use in a review report.

- Major Revision – Detailed Justification**

No.	Manuscript line/section	Reviewer concern	Why revision is required
1	Lines 92–96 – Population and sampling	The manuscript states “cinq (06) producteurs” but then reports six producers.	This is an internal inconsistency in the sample description and must be corrected because the exact sample size is fundamental to interpreting the production analysis.
2	Lines 91–96 – Sampling of households	Producers/distributors were purposively sampled, but the method used to select the 152 households is not adequately described.	The authors need to explain the sampling frame, recruitment procedure, geographic distribution, inclusion process and whether the sample can represent households in the Savanes region.
3	Lines 94–103 – Definition of household sample	The manuscript describes the 152 households as “utilisateurs” while the outcome variable subsequently contains both Yes and No categories.	The terminology should be corrected. If the sample includes both users and non-users, it should be described as households/eligible respondents rather than exclusively “users.”
4	Lines 116–119 – Main outcome	“Utilisation” is defined simply as Yes/No , but no recall period, frequency, quantity, duration, or	This is important because occasional use and regular

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		operational definition of use is provided.	use are very different outcomes. The authors should clearly define what constituted "use" and over what period.
5	Lines 121–132 – Statistical methods	Several statistical packages are used (Excel, GraphPad Prism, SPSS and R), but the manuscript does not clearly describe the complete analytical workflow or data-validation procedures.	The authors should clarify which software was used for each analysis and how data quality, missing data and coding were handled.
6	Lines 125–127 – Reporting of quantitative data	Results are reported as mean ± ESM , but the manuscript does not demonstrate that the assumptions necessary for parametric comparisons such as ANOVA were satisfied.	The authors should report distribution/normality assessment and justify the use of mean ± SEM and ANOVA, or use appropriate non-parametric methods where necessary.
7	Lines 129–132 – ANOVA	ANOVA is used with very small groups, particularly among producers/distributors.	With such small sample sizes, the validity and statistical power of ANOVA should be carefully justified. Group sizes and assumptions should be explicitly reported.
8	Lines 157–177 – Production results	Production volumes are compared across legal status, location and enterprise type using very small numbers of production units.	These findings should be presented primarily as descriptive observations unless the statistical analysis is adequately

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9	Lines 179–195 – Spearman correlations	Correlations such as $\rho = 0.515$ and $\rho = 0.636$ are described despite $p > 0.05$.	justified. The manuscript currently risks giving excessive inferential weight to a very small sample. The manuscript should clearly distinguish the magnitude of a correlation from statistical evidence. With such a small number of producers, these estimates are highly uncertain and should not be interpreted as meaningful associations without appropriate confidence intervals.
10	Lines 198–214 – Distributor perception	Claims regarding favorable maternal perception are based entirely on reports from only nine distributors , rather than directly collected information from mothers.	The wording should be changed from maternal perception to distributors' perceptions of mothers' attitudes , unless mothers themselves were surveyed. Nine distributors are insufficient to establish market-wide demand. The conclusion should be restricted to the surveyed distributors and described as descriptive evidence.
11	Lines 203–210 – Demand interpretation	The manuscript concludes that products are well integrated into the market based on distributor responses.	
12	Lines 239–256 –	A statistically significant ANOVA result is reported	The authors should provide

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	Sales analysis	for legal status with only a very small number of distributor observations.	group sizes, assumptions, effect size and preferably confidence intervals. The practical significance of the difference should also be discussed rather than relying only on $p < 0.05$. The small number of outcome events creates limited statistical power.
13	Bivariate analysis	The study reports no significant sociodemographic associations, but the number of non-users appears to be only 14 of 152 households .	“No significant association” should not be interpreted as proof that no association exists. Confidence intervals and statistical power/precision should be considered. The authors should explain the choice of GVIF
14	Lines 329–350 – Multicollinearity	The authors state that there is no problematic multicollinearity based on transformed GVIF values, but some raw GVIF values are relatively high, particularly education (12.210) and profession (9.442).	criterion and its transformation and provide a clearer justification that the model is not affected by collinearity.
15	Lines 353–368 – Model performance	The model reports an AUC of 0.958 and describes this as “excellent.”	This is an apparent in-sample discrimination measure . With only 152 observations and many predictors, the AUC may be optimistic. Internal

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			validation, bootstrap validation or cross-validation should be considered, or the claim should be substantially tempered.
			Although Firth regression can reduce separation and small-sample bias, it does not automatically solve the problem of an overly complex model. The authors should justify the predictor selection and assess model stability.
			The exact transformation must be explicitly reported.
16	Lines 371–440 – Number of predictors	The Firth model contains a very large number of predictors relative to the small number of non-user observations.	
17	Lines 375–380 and 440 – Household size	The coefficient for household size is $\beta = -6.511$, OR = 0.001, with a very large effect. The manuscript itself says the transformation of household size needs consideration.	The authors should explain how household size was entered into the model and provide an interpretable effect estimate, preferably with confidence intervals. Such an extreme estimate requires careful checking
18	Line 440 – Confidence interval	The OR for household size is reported as 0.001 with an upper CI of 0.038, but the interpretation is not sufficiently developed.	for coding, scaling, transformation and sparse-data effects. The authors should verify the analysis and provide a

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19	Lines 429–438 – Very wide confidence intervals	Several predictors have extremely wide confidence intervals, e.g. biscuit/cake consumption with OR 9.902 and CI approximately 0.506–1346.720.	clinically/socially interpretable presentation. These intervals indicate substantial imprecision. The manuscript should explicitly acknowledge this and avoid interpreting the estimated directions as reliable evidence.
20	Lines 442–554 – Discussion	Some explanations are speculative, for example that household size reduces resources available for infant foods.	These mechanisms were not directly measured in the study. They should be presented explicitly as hypotheses rather than explanations demonstrated by the data.
21	Lines 523–537 – Economic factors	The discussion states that economic, cultural and accessibility factors may influence adoption, but these variables do not appear to have been adequately measured in the presented analysis.	If income, price, affordability, distance to distributors or product availability were not collected, the authors should not imply that these factors were empirically established in this study.
22	Lines 445–472 – Nutritional quality	The study discusses nutritional and sanitary quality of infant flours, but the reported methods/results do not appear to include direct laboratory assessment of nutritional composition or safety.	The manuscript should clearly distinguish literature-based context from variables actually measured in the present study.

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23	Lines 149–153 – Ethics	Ethical principles, consent and anonymization are described, but there is no named ethics committee, approval number or approval date.	For research involving 152 households and human participants, the manuscript should provide the appropriate ethics committee/institution, approval reference and consent procedure, or explain why formal approval was not required. Conclusions should be proportionate to the cross-sectional design, small producer/distributor samples and limited evidence for causal mechanisms.
24	Lines 555–564 – Conclusion	The conclusion makes relatively broad recommendations regarding strengthening production/distribution and household resources.	A thorough language and technical editing is required before publication to improve readability and prevent ambiguity. Examples are visible throughout the methods and results sections.
25	Throughout manuscript	There are numerous language, spacing, formatting and terminology problems, e.g. “GraphPadPrism,” “Firth'sPenalizedLikelihoodLogisticRegression,” missing spaces, inconsistent numbering and table formatting.	

- **My strongest reviewer concerns would be Nos. 13, 16, 17 and 18**—the small number of non-users versus the large number of predictors, together with the extreme household-size estimate and very wide confidence intervals. These are more important than simple language or formatting errors because they directly affect the credibility of the main statistical conclusion.

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