



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



# FISHFIRST! ZAMBIA: COMFA+FISH PHASE II SENSORY PANELS I-II RESULTS

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Photo: K. Ragsdale, Mississippi State University



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We gratefully acknowledge and thank the United States Agency for International Development (USAID) and the Feed the Future Innovation Lab for Fish for their generous support, which makes our work possible

This presentation is made possible by the generous support of the American people provided to the Feed the Future Innovation Lab for Fish through USAID under award no. 7200AA18CA00030 (M. Lawrence, PI). FishFirst! Zambia is supported by the Fish Innovation Lab under sub-award no. 322554-012200-027000 (K. Ragsdale, U.S. PI; N. Mudege, Zambia PI; M. Read-Wahidi, U.S. Co-PI)

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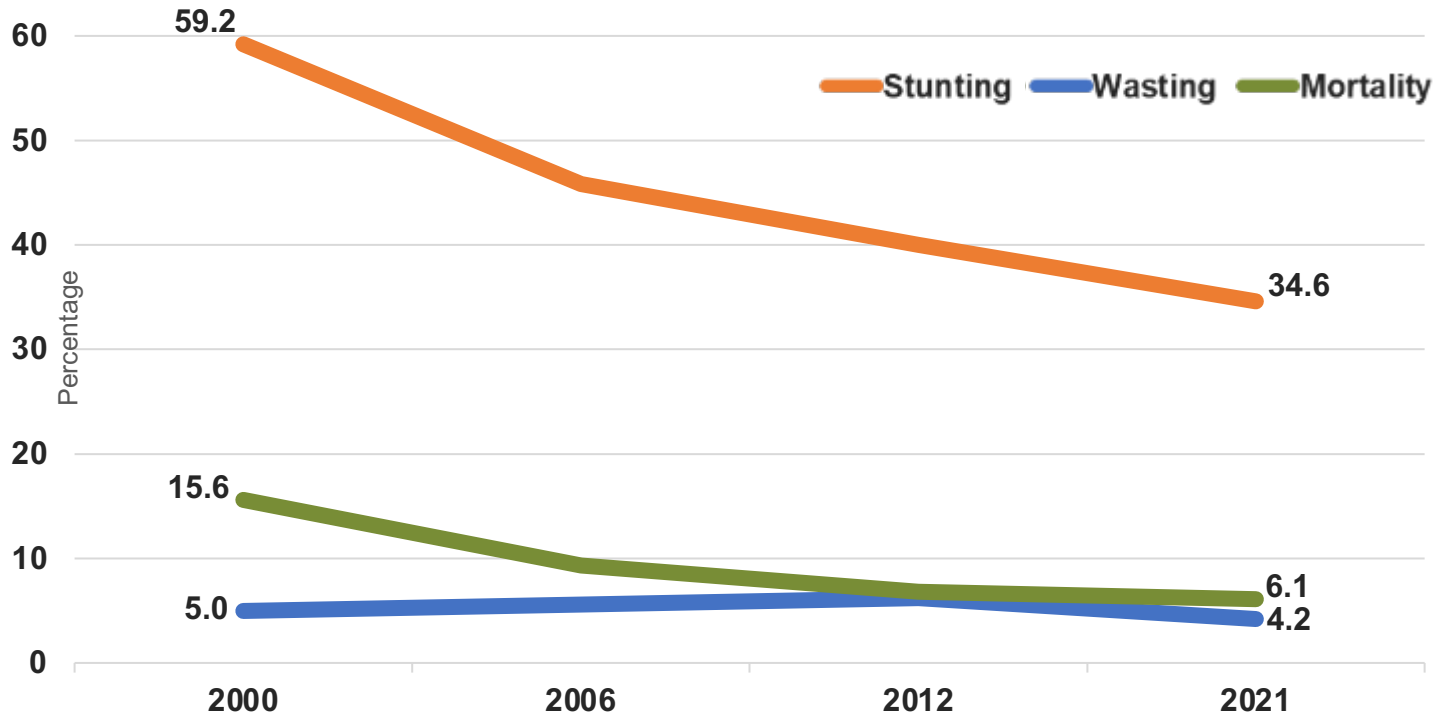


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## GLOBAL HUNGER INDEX<sup>1</sup>

### Zambia: Percentage Change for Childhood Stunting, Wasting & Mortality from 2000 to 2021\*



\*Calculations for children under 5 years, based on data underlying Global Hunger Index (GHI) Scores (2000-2021)

1. von Grebmer K, Bernstein J, Resnick D, Wiemers M, Reiner L, Bachmeier M, Hanano A, Towey O, Ni Chéilleachair R, Foley C, Gitter S, Larocque G, Fritschel H. (2022) Global Hunger Index: Food systems transformation and local governance. Bonn: Welthungerhilfe, Dublin: Concern Worldwide. 60 pp. <https://www.globalhungerindex.org/pdf/en/2022.pdf>



## GLOBAL HUNGER INDEX<sup>1</sup>

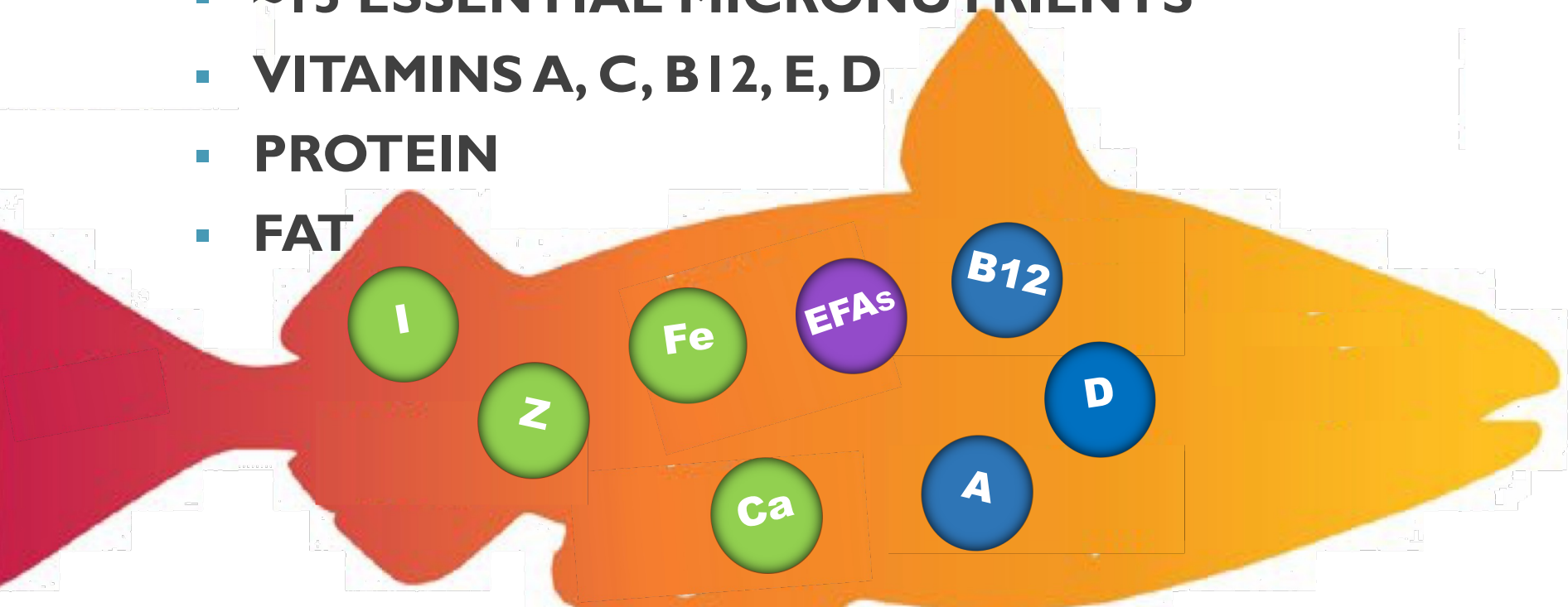
- **Despite progress, the GHI categorizes the hunger situation in Zambia as SERIOUS<sup>1</sup>**
- **Poverty, food insecurity, and child malnutrition remain high in Zambia<sup>2,3</sup>**
- **The rural poor are particularly vulnerable<sup>2</sup>**
- **Among Zambian children under five years:**
  - **Stunting = 34.6% [chronic or recurring malnutrition]<sup>1,2</sup>**
  - **Wasting = 4.2% [acute malnutrition]<sup>1,2</sup>**

# COMPLEMENTARY FEEDING

- **COMPLEMENTARY FEEDING** marks infants' transition from exclusive breastfeeding to beginning to eat 'soft' foods
- However – across sub-Saharan Africa – this transition is associated with **STUNTING** and **COGNITIVE DELAYS** among infants in vulnerable households whose diets rely heavily on maize
- Widely consumed across sub-Saharan Africa, complementary maize porridge is **HIGH** in carbs:
  - **BUT LOW** in vital protein, fats, essential micronutrients and essential vitamins that infants and young children need

# POWER OF DRIED FISH POWDER

- **DRIED FISH POWDER** made from pelagic whole small fish like Kapenta is a protein- and nutrient-dense **ANIMAL SOURCE FOOD** ready to be harnessed to reduce stunting and cognitive delays because:
- Even when consumed in small quantities, dried fish powder adds:
  - **~15 ESSENTIAL MICRONUTRIENTS**
  - **VITAMINS A, C, B12, E, D**
  - **PROTEIN**
  - **FAT**





# WHY IS COMFA+FISH NEEDED?

- We developed Complementary Food for Africa+Dried Fish Powder – **COMFA+FISH** – to harness the power of nutrient-dense **dried fish powder** to impact:
  - Nutritional deficiencies among infants and young children
  - Pregnancy and birth outcomes for women
- **COMFA+FISH**: Primary ingredient is **locally sourced** nutrient-dense dried fish powder using Kapenta, Chisense, Dagaa, etc.
- Other ingredients include **locally sourced nutrient-dense foods** – such as:
  - Groundnut powder, dried pumpkin leaves, soya flour, orange-fleshed sweet potato, dried mushrooms, etc.

# METHODS



Image: Alamy. [https://www.google.com/url?sa=i&url=https://3A1%2F%2Fwww.alamy.com/%2F-vector-map-of-african-lake-kariba-zambia-zimbabwe-image384727522.html&psig=AOvVawjZVYLRR0ChOwUZZoVw&ust=162829812862700&source=images&cd=rf&ved=0CAoQJRoqFwoTCLChorX\\_4PECFQAAAAAABAAABAO](https://www.google.com/url?sa=i&url=https://3A1%2F%2Fwww.alamy.com/%2F-vector-map-of-african-lake-kariba-zambia-zimbabwe-image384727522.html&psig=AOvVawjZVYLRR0ChOwUZZoVw&ust=162829812862700&source=images&cd=rf&ved=0CAoQJRoqFwoTCLChorX_4PECFQAAAAAABAAABAO)

An equal number of mother-child pairs were recruited from Gwembe, Siavonga, and Sinazongwe Districts

# EVAL. QUESTIONS & SCORING

1. How well do you like the aroma / smell of the food? (AROMA)



2. How well do you like the appearance of the food? (APPEARANCE)



3. How well do you like the way the food feels in your mouth? (TEXTURE)



4. How well do you like the flavor / taste of the food? (FLAVOR)



5. How well do you like the sweetness of the food? (SWEETNESS)



6. How well do you like or dislike how easy food will be to use in an infant's meal at least once per day? (CONVENIENCE)



7. Overall, how well do you like the food? (OVERALL ACCEPTIBILITY)



# COMFA+FISH KEY RESULTS: 1

- 42 mothers; 42 infants
- 60% of mothers were 19-29 years old
- 40% of mothers were 30-44 years old
- 38% of children were 6-11 months old
- 62% of children were 12-23 months old



# MOTHER' SENSORY PANEL: TASTE-TESTED 4 COMFA+FISH DISHES FOR CHILDREN AND THE FAMILY

# COMFA+FISH KEY RESULTS: 2

## Mothers' Sensory Panel: SENSORY ATTRIBUTES

ComFA+Fish dishes averaged scores for the five sensory attributes (N=42)

	Extremely Liked / Liked % (n)
Fortified chibwabwa fisashi	93 (39)
Kapenta chutney	93 (39)
Fortified complementary maize porridge	91 (37)
Fortified bean-vegetable soup	88 (21)

# COMFA+FISH KEY RESULTS: 3

## Mothers' Sensory Panel: CONVENIENCE

Four ComFA+Fish dishes (N=42)

	Extremely Liked / Liked % (n)
Fortified chibwabwa fisashi	93 (39)
Kapenta chutney	93 (39)
Fortified complementary maize porridge	91 (37)
Fortified bean-vegetable soup	88 (21)

# COMFA+FISH KEY RESULTS: 4

## Mothers' Sensory Panel: OVERALL ACCEPTABILITY

Four ComFA+Fish dishes (N=42)

	Extremely Liked / Liked % (n)
Fortified chibwabwa fisashi	100 (42)
Kapenta chutney	100 (42)
Fortified complementary maize porridge	88 (37)
Fortified bean-vegetable soup	88 (21)



**INFANTS' SENSORY PANEL: INFANTS  
TASTE-TESTED COMFA+FISH FORTIFIED  
COMPLEMENTARY MAIZE PORRIDGE**

# COMFA+FISH KEY RESULTS: 5

## Infants' Sensory Panel: GLOBAL LIKING

Global liking of ComFA+Fish complementary maize porridge (N=42)

	Extremely / Liked % (n)
Fortified complementary maize porridge: 6-11 months old (n=16)	98 (15)
Fortified complementary maize porridge: 12-23 months old (n=26)	92 (24)



# CONCLUSIONS

- **Mothers' Sensory Panel:**
  - **CONFIRMED** high acceptability of all four ComFA+Fish fortified dishes for infants and the family
- **Infants' Sensory Panel:**
  - **CONFIRMED** high acceptability of ComFA+Fish complementary maize porridge among infants
- Results show **dried fish powder is feasible** to improve nutrition security among vulnerable infants and families – including those who **rely on maize** for much of their food
- **Dried fish powder** can address stunting and nutrient deficiencies in Zambia and across sub-Saharan Africa (SSA) – which consumes 21% of maize produced worldwide<sup>3,4</sup>

3. Filitani P (2019) Why Africa should 'stop eating one of its favourite foods.' <https://www.bbc.com/news/world-africa-49714037>.

4. Mordor Intelligence (2022) Africa maize market – growth, trends, COVID-19 impact, and forecasts (2022 - 2027). <https://www.mordorintelligence.com/industry-reports/african-maize-market#>.

# SUSTAINABILITY / SEEKING FUNDING

- **FishFirst! Zambia** was the necessary **FIRST STEP** to ground-proof the scalability of ComFA+Fish to address protein and micro-nutrient deficiencies and improve birth outcomes in Zambia and sub-Saharan Africa
- **NEXT STEP:** Seek funding to conduct a randomized controlled trial (RCT) among infants 6-8 months old in Zambia
  - **AIM 1 (YEAR ONE):** Determine effects of receiving ComFA+Fish on infants' growth, anemia, etc., over **12 months**
  - **AIM 2 (YEAR TWO):** Determine the sustained effects of receiving ComFA+Fish on infants' growth, anemia, etc., over **24 months**





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# Twalumba Kapati!

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