

Acceptability of fortified complementary foods in Lào Cai, Việt Nam

Y.V. Yuan, C. Rocha, School of Nutrition, Ryerson University, Toronto, ON Canada

B.H. Do, M. Brown, P. Huynh, H. Nguyen, National Institute of Nutrition, Ha Noi, Việt Nam



ABSTRACT

Background: In rural northern Vietnam, childhood stunting rates are 15-27.5%. In Lào Cai province, female subsistence farmers grow crops, but face barriers sending produce to markets. The present intervention purchases these crops which are processed in local small-scale food processing facilities (SSFPF) to produce instant fortified complementary foods (FCF) for weaning.

Methods: This project leverages the experience of the NIN of Vietnam to ensure HACCP and ISO 22000 standards during manufacture. Locally grown rice was combined with a Zn/Fe premix before extrusion and hammer-milling. Local vegetables such as: "Sweet leaf" (*Sauropus androgynous*), pumpkin, Shiitake mushrooms (*Lentinula edodes*) and carrots were dehydrated and hammer-milled.

Results: Sensory testing in Lào Cai with parent/caregiver-child pairs (n=126) showed that acceptability of rice milled into a homogeneous particle size was sub-optimal; whereas different particle sizes gave a better texture. The rice with pumpkin FCF scored highest using a 7-point hedonic scale, followed by Shiitake, carrot and "Sweet leaf". A "just-about-right" scale showed high satisfaction among subjects (81-92%) for product consistency, fat content and saltiness.

Conclusion: Producing FCF in local SSFPF can assist with nutrition-based interventions with high acceptability, in an effort to improve food security and access to fortified complementary foods for weaning in northern Vietnamese provinces.

SSFPF is capable of producing 100 tons of fortified instant porridge a year and 2 million vegetable packets; the majority of factory workers are women.



Product branding and identity.



Sensory testing was performed to quantify the acceptability of four types of instant FCF: Sweet leaf, pumpkin, shiitake mushrooms and carrots added to a rice base.

Three sensory analyses were used: a) a validated organoleptic sensory test (ISO 11136:2014) for rating the smell, flavour, structure, after-taste and overall preference of the 4 FCF using a 7-point hedonic scale; b) a "Check-All-That-Apply" dimensions test was used to highlight descriptive attributes; c) a "Just-About-Right" scale was used to measure satisfaction with the consistency, fat content, and saltiness of FCFs.

INTRODUCTION

Focus of the project: 3 provinces in North Việt Nam:

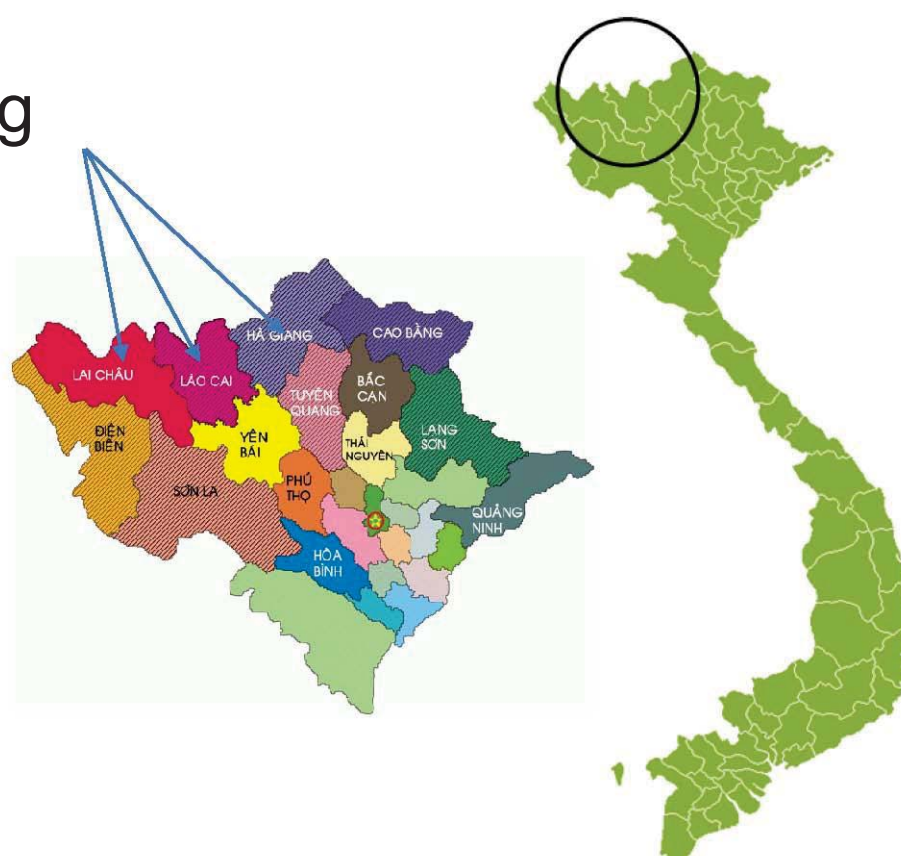
Lào Cai, Lai Châu, Hà Giang

•Poverty rates: 26, 22, 35%

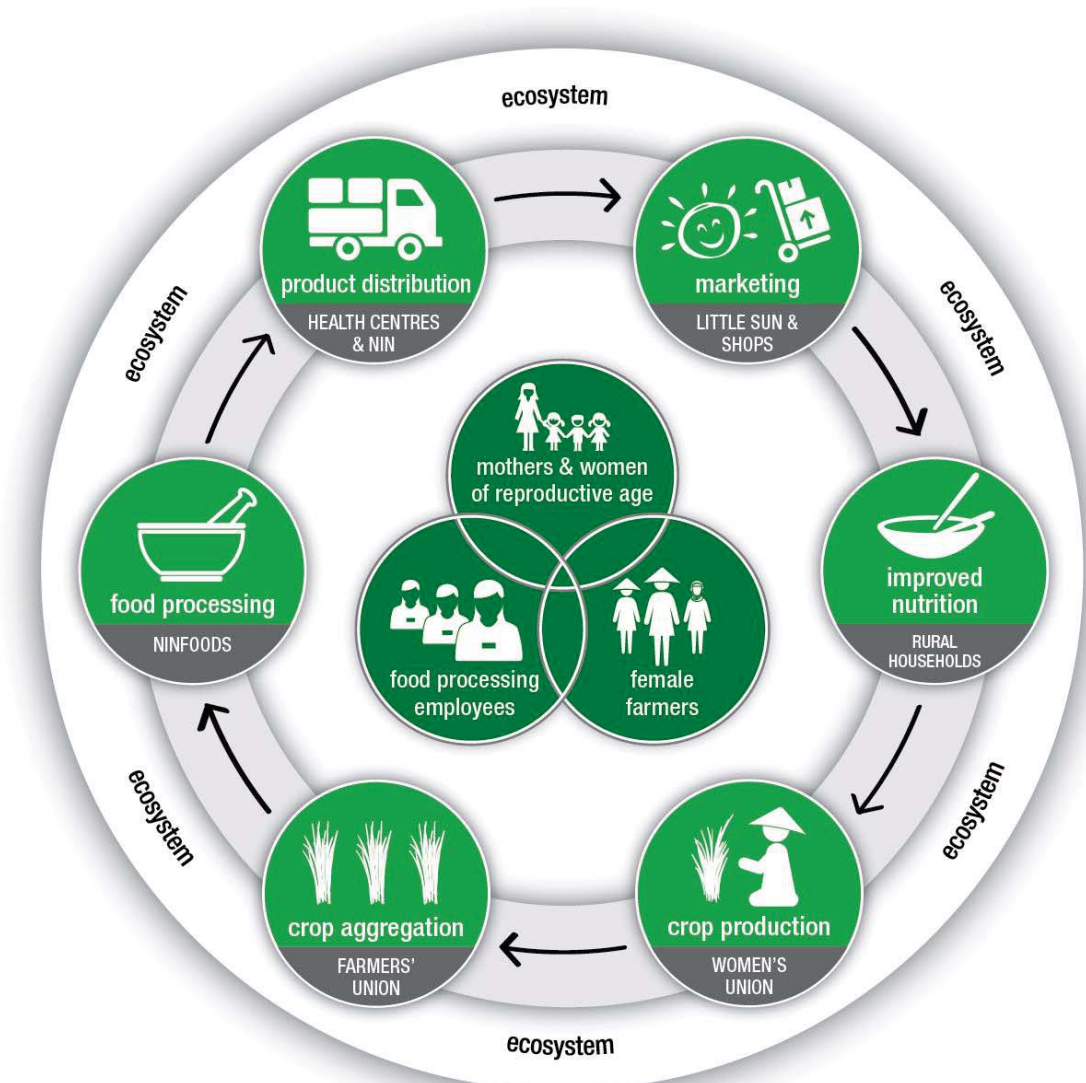
• Stunting: 35.2-36.7%

•Underweight: 20-23.2%

• Wasting: 5.8-9.8%



MATERIALS AND METHODS



The project's Food Systems Approach to align with Agriculture and Food Security foci.

Carrots, pumpkin and Sweet Leaf were purchased from a local agricultural co-op in Bát Xát commune (17 women farmers) who were using GAP, to produce the ECOSUN FCF.



RESULTS

The pumpkin FCF scored highest for acceptability of smell, flavor, structure, after-taste and overall preference. There was no difference between the **overall preference** of **pumpkin** (5.4/7) and **shiitake** FCF (5.2/7), with a score of 5/7 classified as "**liked**". Both pumpkin and shiitake FCF scored significantly higher ($p < 0.05$) than the **carrot** (5.0/7) and **Sweet leaf** (4.8/7) FCF, with a score of 4/7 classified as "**marginally acceptable**".

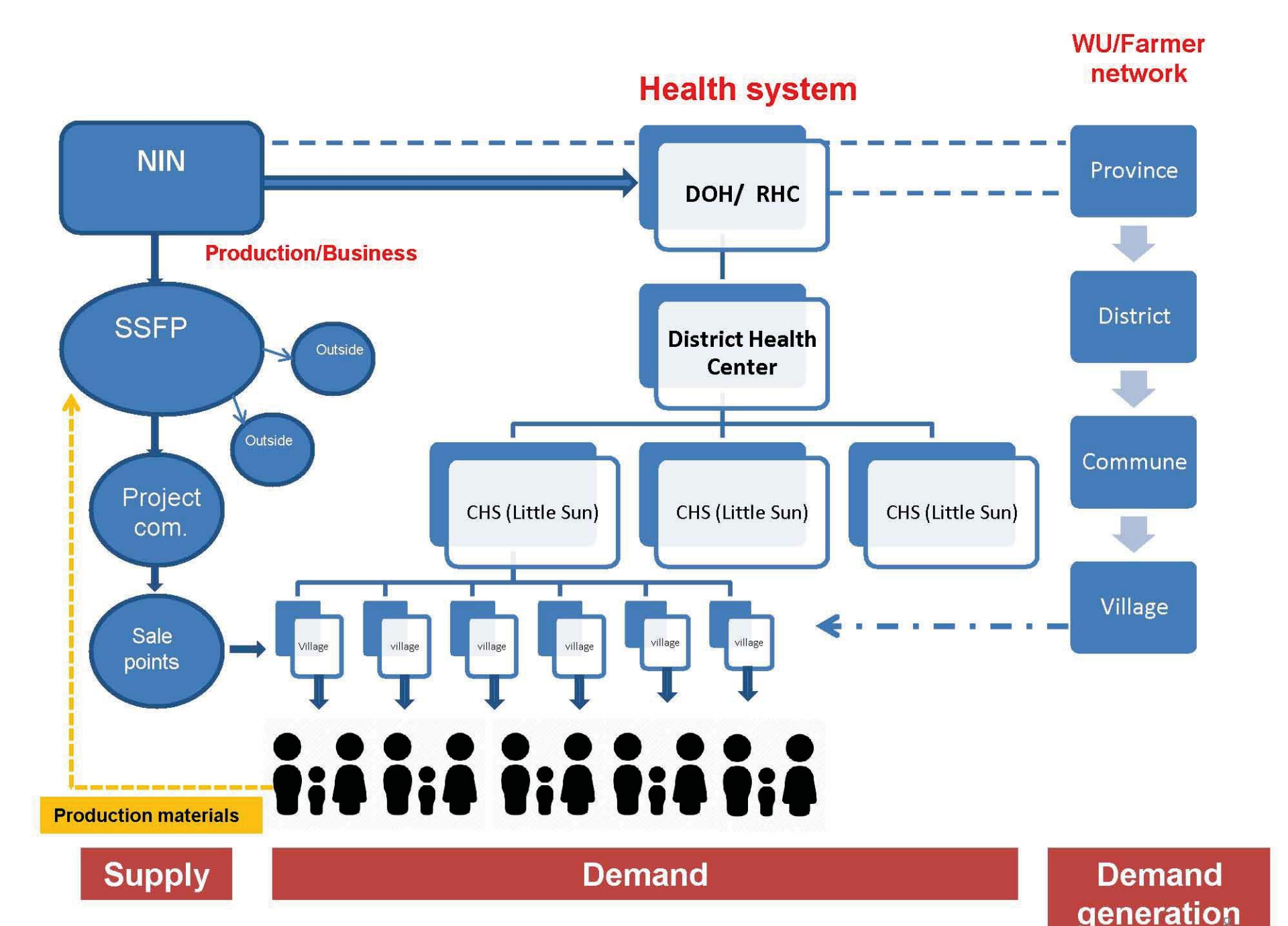
With the "Check-All-That-Apply" dimensions test, participants described the pumpkin and shiitake FCF as "**eye-catching, aromatic, smooth, and savoury**"; carrot FCF as "**smooth, eye-catching, having a vegetable taste, and savoury**"; and Sweet leaf FCF described as "**savoury, having a vegetable taste, smooth, and aromatic**".

The "Just-About-Right" scale showed a high satisfaction for consistency, fat content and saltiness of each FCF with satisfaction ranging from 81-92%.

IMPLEMENTATION OF FCF



Set up of Little Sun Nutrition Counselling Centres for IYCF counselling of mothers.



Mapping of impact of project on North Việt Nam nutrition, IYCF, food security, GAP and sustainability of Food Systems Ecosystem Approach.

ACKNOWLEDGEMENTS

National Institute of Nutrition, Ministry of Health Việt Nam
NINFoods

Centre for Studies in Food Security, Ryerson University, Canada

IDRC/GAC Grant No. 108124 –CIFSRF Phase 2