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**Chapter 9: Fortification Vehicles Pages 85 – 92**

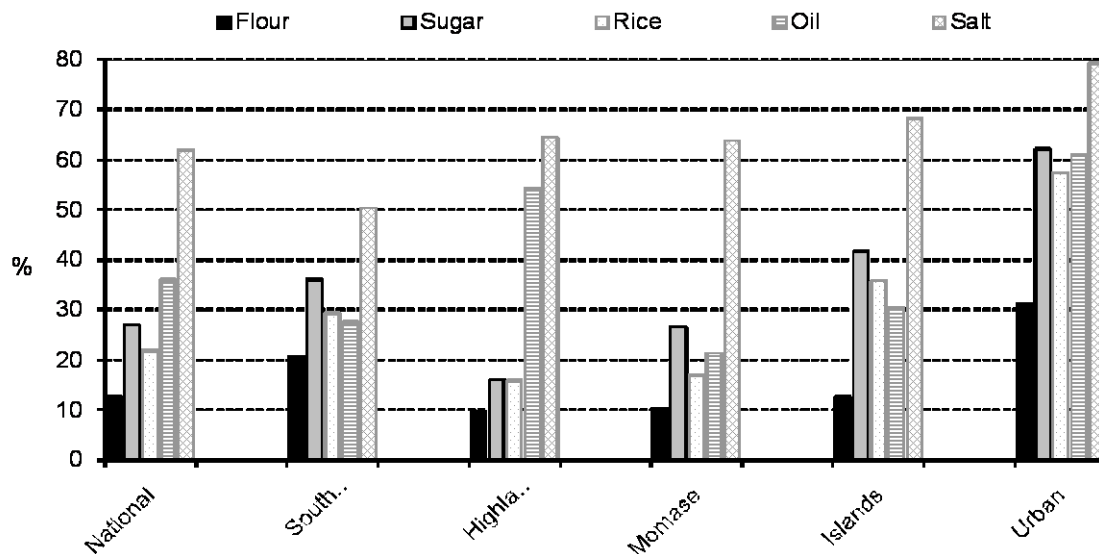
## CHAPTER 9. FORTIFICATION VEHICLES

This chapter summarizes indicators related the availability of fortification vehicles (staple food products) in the household. One of the objectives of this survey was to identify potential food vehicles that could be fortified in Papua New Guinea.

The survey looked at five foods that could potentially be used as fortification vehicles. The foods of interest were flour, sugar, oil, rice and salt. The questions focused on the presence of these staples in the household at the time of the survey, the form of the product and the brand. The information collected from the survey will be used in conjunction with the data collected during the food fortification situational analysis that was conducted in July 2006 by Quentin Johnson from the Micronutrient Initiative to help the government of PNG to plan its fortification strategy (annex 14).

The presence of staple foods present in the household at the time of data collection is presented in Figure 9.1.

**Figure 9.1 Prevalence of potential fortification vehicles in the household on the day of the survey, PNG National Nutrition Survey 2005**



Of the households surveyed, 30.5% had none of the 5 staple products in the household on the day of the survey, 52.8% had 1-2 products and 35.6% had 3-5 products. Table 9.1 and Figure 9.2 present the number of staple foods a household had on the day of the survey. Regionally the Southern region had the greatest proportion of households with no staple products (39.3%). The Islands region had the greatest proportion of households with 3 -5 staple food items (33.9%). There is a strong association between the number of staple foods and urban and rural location. In rural households 34.6% had

no staple food item versus only 10.4% of urban households. In urban areas 63.7% had 3-5 staple products compared to only 18.0% in rural areas.

**Table 9.1 Prevalence of potential fortification vehicles in households, PNG National Nutrition Survey 2005**

Demographic characteristics	Prevalence of staple food items in the household (%) (CI 95%)			
	N	0 products	1-2 products	3-5 products
<b>National</b>	1401	30.5 (24.9, 36.8)	43.8 (38.7, 49.1)	25.7 (20.5, 31.7)
<b>Region</b>				
Southern	341	39.3	27.6	33.1
Highlands	358	27.7	50.0	22.3
Mamose	354	31.6	48.3	20.1
Islands	348	23.3	42.8	33.9
<b>Residence</b>				
Urban	241	10.4	25.8	63.7
Rural	1160	34.6	47.4	18.0

Weighted analysis to account for complex survey design

## 9.1 Flour

Nationally 12.7% of households had some form of flour on the day of the survey. The Southern region had a higher prevalence of flour in the household than the other regions. Although the proportion of households with flour was low nationally almost a third of households in urban areas had flour (Table 9.1).

The most common type of flour found in households nationally was plain white flour (83.6%). However, in the Highlands and Mamose region approximately one quarter of households had whole meal flour. All flour that was in the households was purchased and in 40.2% of households the flour was still in the original packaging.

**Table 9.1 Availability and type of flour available in the household, PNG National Nutrition Survey 2005**

	Households with flour available by region and urban and rural locality (%)						
	National	Southern	Highlands	Mamose	Islands	Urban	Rural
Flour present in household	12.7	20.8	9.8	10.5	12.7	31.2	9.0
<b>Type of flour among households with flour (%)</b>							
Whole meal	15.6	4.3	24.2	25.0	11.4	19.1	13.1
White	83.6	92.9	72.7	75	84.1	78.5	84.3
Not available for observation	2.7	2.9	3.0	0	4.5	2.4	2.6

Weighted analysis to account for complex survey design

The main brands of flour purchased are presented in Table 9.2. The most popular brand of flour is Flame. In 77.5% of the households the flour available was "Flame".

**Table 9.2 Brand of flour available among households with flour by region and urban/rural locality, PNG National Nutrition Survey 2005**

	(%)						
	National	Southern	Highlands	Mamose	Islands	Urban	Rural
Mothers choice	9.5	21.2	4.0	0	2.4	10.9	7.4
3 roses	13.0	4.5	20.0	16.7	19.0	14.4	12.7
Flame	77.5	74.2	76.0	83.3	78.6	74.7	79.9

Weighted analysis to account for complex survey design

## 9.2 Sugar

Nationally, 27% of households had some form of sugar on the day of the survey. Just under half of all households in the Islands had sugar. Availability of sugar in the household was strongly associated with urban/rural locality with two thirds of households in urban areas having sugar compared to only 19.9% of rural households. The main types of sugar that were present in the household at the time of data collection are presented in Table 9.3. In the households that had sugar 58.4% of households had kept the sugar in its original packaging.

The most common type of sugar found in households nationally was white sugar (81.8%). However, in the Southern region 30.3% of households and 26.4% of households in Mamose region had brown sugar. The most popular brand of sugar was Ramu.

**Table 9.3 Availability and type of sugar available in the household by region and urban/rural locality, PNG National Nutrition Survey 2005**

	Households with sugar on the day of the survey (%)						
	National	Southern	Highlands	Mamose	Islands	Urban	Rural
<b>Sugar present in household</b>	27.0	36.0	16.2	26.6	41.7	62.2	19.9
<b>Type of sugar in households with sugar (%)</b>							
White sugar	81.8	65.5	94.4	72.5	96.5	76.8	83.4
Brown sugar	15.7	30.3	0	26.4	2.8	19.3	14.5
Not available for observation	2.5	4.2	5.6	1.1	0.7	3.8	2.2

Weighted analysis to account for complex survey design

### 9.3 Rice

Nationally, 22% of households had some rice in the household on the day of the survey. Just over a third of all households in the Islands had rice. As with the other staple foods, the availability of rice in the household was strongly associated with urban/rural locality with almost two thirds of households in urban areas having rice compared to only 14.9% of rural households. In households that had rice on the day of the survey, rice was purchased by 98.5% of the households and in 92.1% of households rice was still in its original packaging. The most common type of rice found in households nationally was white rice (97.3%).

The main brands of rice purchased are presented in Table 9.4. The most popular brand of rice is Roots (66%).

**Table 9.4 Availability and brand of rice available in the household by region and urban/rural locality, PNG National Nutrition Survey 2005**

	Households with rice on the day of the survey (%)						
	National	Southern	Highlands	Mamose	Islands	Urban	Rural
<b>Rice present in household</b>	22.0	29.4	15.9	16.9	35.9	57.4	14.9
<b>Brand of rice among households with rice(%)</b>							
Ezy Cook	3.0	1.1	2.1	7.5	2.6	3.5	2.9
Flame	3.9	4.5	2.1	7.5	2.6	5.4	3.1
Roots	66.1	47.7	85.1	45.3	81.9	46.9	79.9
Trukai	24.7	44.3	10.6	32.1	12.1	41.0	12.2
Other	2.3	2.3	0	7.5	0.9	3.3	1.9

Weighted analysis to account for complex survey design

## 9.4 Oil

Nationally, 36.0% of households had some form of oil on the day of the survey. Just over half of all households in the Highlands had oil. Availability of oil in the household was strongly associated with urban/rural locality with two thirds of households in urban areas having oil compared to only one third of rural households. In households that had oil on the day of the survey, oil was purchased by 91.6% of the households. In 97.5% of households, the oil was still in its original packaging.

The most common type of oil found in households nationally was vegetable oil (47.6%). The second most popular type of oil was cooking oil (38.9%). The most popular brand of oil is Superior (22.4%), but there is a wide variety of brands of oil available which make up the composite category “other”. Table 9.5 presents the availability and brands of oil available in the households included in the survey.

**Table 9.5 Availability and brand of oil available in the household by region and urban/rural locality, PNG National Nutrition Survey 2005**

	Households with oil on the day of the survey (%)						
	National	Southern	Highlands	Mamose	Islands	Urban	Rural
Oil present in household	36.0	27.6	54.2	21.5	30.5	60.9	31.1
Brand of oil in households with oil (%)							
Globe	9.8	4.7	3.7	27.8	11.8	9.7	9.8
Highland meadows	15.3	20.9	20.1	8.3	1.1	13.1	16.3
Mama	17.5	12.8	17.9	19.4	19.4	17.0	17.7
Superior	22.4	8.1	35.8	8.3	15.1	12.4	27.3
Other	35.0	53.5	22.4	36.1	52.7	47.7	28.8

## 9.5 Salt

At least one type of salt was present in 61.9% of all of the households surveyed. Most of the salt available in the households was fine Table salt or cooking salt (90.2%). Salt was purchased by 98.8% of the households that had salt on the day of the survey and in 53.6% of households; the salt was still in its original packaging. Some families reported buying salt refills and adding it to their original container.

The most popular brand of salt is Tru Cook (28.0%), but there is a wide variety of salt available. Table 9.6 presents the brands of salt available in the households included in the survey.

**Table 9.6 Availability and brand of salt (in original containers) in the household by region and urban/rural locality, PNG National Nutrition Survey 2005**

	Households with salt available on the day of the survey (%)						
	National	Southern	Highlands	Mamose	Islands	Urban	Rural
<b>Salt present in household</b>	61.9	50.4	64.5	63.8	68.1	79.2	58.5
<b>Brand of salt in household with salt (%)</b>							
Crystal	14.7	42.4	2.6	19.2	5.7	30.9	10.7
Jumbo	24.8	15.3	43.5	12.3	17.1	14.4	27.5
King	9.7	22.4	3.5	12.3	5.7	17.4	7.7
Saxa	3.6	1.8	0.9	2.3	4.1	12.1	1.4
Sky	5.4	-	-	16.9	-	2.4	6.1
Tru cook	28.0	-	34.8	20.0	56.1	11.1	32.2
Other	13.9	8.2	14.8	16.9	11.4	11.6	14.4

Weighted analysis to account for complex survey design

## 9.6 Discussion: Fortification vehicles

The survey data indicate that potential fortification vehicles are much more available in urban areas versus rural and in some regions more than others in PNG. The Highlands and Mamose have fairly limited availability of fortification vehicles in the household compared to the Islands and the Southern region. One reason that the Southern region has more access to fortification vehicles is because this region encompasses the National Capital District (NCD).

Out of the five vehicles discussed in the survey, salt was the most common food item present in the household in all regions. In the questionnaire, the household head was asked if the household had that specific item on the day of the survey, which means that they might not have had it the day before. The results show that salt is the most common commodity, followed by oil and sugar.

When comparing the number of households by region and by rural and urban location, rural households tended to have far fewer potential fortification vehicles. In rural areas 34.6% of households had none of the 5 commodities versus 10.4% in urban areas.

### Flour

Flour was the least common vehicle available in the households on the day of the survey. In households that did have flour, it tended to be white flour. There are few brands of flour available and the predominant brand is Flame.

### Sugar

Sugar was much more common in urban rather than rural areas. Almost 50% of households in the Island's region had sugar on the day of the survey. White sugar was the most common and the predominant brand is Ramu.

Rice

Again rice was more common in households in urban areas. There are many brands of rice in PNG and the predominant brand used was Roots rice.

Oil

Oil was the second most common food commodity in households. Vegetable oil was the most common type of oil but again there were many brands with no brand more predominant.

Salt

Salt was the most common food commodity in the household. There were many brands of salt with Tru Cook and Jumbo being the most popular.