



FORTIFICATION COSTING OF WHEAT FLOUR IN AFGHANISTAN

FOOD FORTIFICATION AS A COST-EFFECTIVE STRATEGY
FOR ECONOMIC GROWTH

June 2017

DOCUMENT INFORMATION

The Global Alliance for Improved Nutrition (GAIN) prepared this study to determine the impact of fortification on the national cost and retail price of wheat flour produced by mills in Afghanistan, as well as on imports into Afghanistan from Kazakhstan and Pakistan. Statistics, information, estimates and conclusions in this report are based on information provided by stakeholders.

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DISCLAIMER

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TABLE OF CONTENTS

Document Information.....	1
Acknowledgements	1
Background.....	3
Cost impact analysis.....	4
Costing	5
Table 1: Summary of Costs	5
Comparative analysis.....	5
Tables 2, 3 and 4: wheat flour comparative cost analysis	6
Other considerations	7
Conclusions.....	7
ANNEX 1: Consultations.....	8
Annex 2: Costing model structure	9

BACKGROUND

Micronutrient malnutrition is a major problem in Afghanistan. Half of all children 6-59 months old are vitamin A deficient, while sixty-four per cent lack adequate vitamin D in their diets. About thirteen per cent of children and of women of reproductive age have iron deficiency anemia and 7 per cent of adolescent girls (10-19 years) had folate deficiency.

Malnutrition is estimated to contribute to at least 45 per cent of child deaths in Afghanistan and affects health and development at individual, community and societal levels. It is especially serious for the most vulnerable – the poor, women, children, internally displaced people and returning refugees.

Fortifying staple foods and condiments with essential micronutrients, when appropriately implemented and enforced, is considered one of the most cost-effective, scalable and evidence-based strategies to address widespread micronutrient deficiency.

One intervention in particular has tremendous potential in Afghanistan. Fortifying locally-produced and imported flour with essential micronutrients can significantly improve the nutritional status of the population. More than 25-30 percent of Afghan households purchase wheat flour. In urban areas, that figure rises to almost 90 percent. Afghanistan has one of the largest per capita, per month consumption of wheat flour in the world. Commercial flour imported into Afghanistan is not generally fortified. Bread is consumed by most in Afghanistan, usually at every meal, with an estimated per capita consumption of 430 grams per day¹. GAIN, with financial support from USAID, has been working with the Government of Afghanistan, private sector partners, and others, to build an enabling environment for fortification. Prior to further adopting wheat flour fortification as an intervention to tackle micronutrient deficiencies, a robust analysis of flour fortification needed to be conducted to determine its cost effectiveness in addressing iron and folic acid deficiencies.

Firstly, a Cost Benefit Analysis (CBA) conducted by GAIN with support from USAID, looked at the cost-effectiveness of wheat flour fortification in addressing micronutrient malnutrition. Analysis revealed that over a ten-year period, a successful fortification program would reduce these losses by USD664.69 million. The CBA estimated the cost of such a ten-year wheat flour fortification program in Afghanistan at USD 53.34 million, with the potential to generate 12 times more benefit than cost. Direct cost to the consumer would be just over one per cent of the current average retail price of wheat flour.

In December 2016, the Afghan government worked with partners to hold a high-level summit to advance the food fortification agenda, bringing together key partners on achieving food fortification within Afghanistan and ensure that imported staple foods are fortified to meet the needs of the Afghan population. In 2017, countries in the region adopted a harmonized fortification standard that would meet the nutritional needs of people across the region.

This study helps make the case, and prepare the ground for, future action.

¹ ANSA flour fortification standard, 2013

COST IMPACT ANALYSIS

This study analyzes the cost of fortification of wheat flour in Pakistan, Afghanistan and Kazakhstan, using both Afghan and regional harmonized standards; assesses its impact on market prices of wheat flour for a sustainable fortification program in Afghanistan; and makes recommendations on policy and pricing strategies for domestic and cross-border trade. It provides an independent framework to determine fortification cost, and was developed following discussions with stakeholders as set out in Annex 1. Annex 2 sets out different fortification scenarios and the structure of the costing model. Calculations deal only with the cost of fortifying wheat flour in Pakistan, Kazakhstan and Afghanistan.

SCENARIOS AND STANDARDS FOR ANALYSIS OF FORTIFICATION COSTS

Afghanistan

- To ANSA Standard; (Iron 15 ppm, Folic Acid 1.0 ppm, B12 – 0.008 ppm & Zinc 50 ppm) at 20 ppm premix addition rate
- To regional recommendations (Iron 15 ppm, Zinc 30 ppm, Folic Acid 1 ppm, Vitamin B12 0.004, Vitamin B1 2 ppm, Vitamin B2 3 ppm, Vitamin B3 10 ppm) at 20 ppm premix addition rate.

Pakistan

- To Pakistan recommended standard – IRON EDTA and Folic Acid (Iron 15 ppm, Folic Acid 1.5 ppm) 15 ppm premix addition rate;
- To ANSA Standard – (Iron 15 ppm, Folic Acid 1.0 ppm, B12 – 0.008 ppm & Zinc 50 ppm) at 20 ppm premix addition rate
- To regional recommendations (Iron 15 ppm, Zinc 30 ppm, Folic Acid 1 ppm, Vitamin B12 0.004, Vitamin B1 2 ppm, Vitamin B2 3 ppm, Vitamin B3 10 ppm) at 20 ppm premix addition rate.

Kazakhstan

- To Kazakhstan Wheat Flour Fortification Standards (Iron 45 ppm, Zinc 20 ppm, Folic Acid 1 ppm, Vitamin B1 1.8 ppm, Vitamin B2 1.4 ppm, Vitamin B3 16 ppm) at 15 ppm premix addition rate
- To ANSA Standard – (Iron 15 ppm, Folic Acid 1.0 ppm, B12 – 0.008 ppm & Zinc 50 ppm) at 20 ppm premix addition rate
- To regional recommendations (Iron 15 ppm, Zinc 30 ppm, Folic Acid 1 ppm, Vitamin B12 0.004, Vitamin B1 2 ppm, Vitamin B2 3 ppm, Vitamin B3 10 ppm) at 20 ppm premix addition rate

COSTING

The cost of fortifying wheat flour to the recommended Afghan standard (ANSA) is 14.41 Afghani (0.22 USD) per 50kg bag, 0.96 per cent of the current retail price of Afghani per 50kg bag (Table 1). Fortifying flour exported from Pakistan to ANSA standard would cost an additional 9.06 Afghani (0.14 US dollars) per 50kg bag, 0.6 per cent of current retail price (Table 1). Fortifying flour from Kazakhstan to ANSA standard will cost an additional 11.2 Afghani (0.17 US dollars) per 50kg bag. Accordingly, fortification cost is 0.75 per cent of the current retail price of wheat flour (Table 3). The average additional cost of wheat flour fortified to ANSA standards is 11.5 Afghani (0.17 US dollars) per 50kg bag. This equates to 0.77 per cent of the current retail price of 50kg bag.

Fortification costs are lower when using Pakistan and Kazakhstan standards compared with the Afghan standards (Tables 2, 3 and 4). This is due to reduced premix incorporation rates.

Wheat price is the largest contributor to total wheat flour cost, ranging from 42 per cent in Kazakhstan to 69 per cent in Pakistan. The price of wheat in Kazakhstan is one of the lowest in the region due to large production volumes.

TABLE 1: SUMMARY OF COSTS

	Afghanistan	Pakistan	Kazakhstan	Average
Afghani per 50 kg bag				
ANSA Standards	14.41	9.06	11.20	11.56
Pakistan Standards		6.78		6.78
Kazakhstan Standards			7.91	7.91
Regional Harmonized Standards	13.87	8.63	10.63	11.04
USD per 50 kg bag				
ANSA Standards	0.22	0.14	0.17	0.17
Pakistan Standards		0.10		0.10
Kazakhstan Standards			0.12	0.12
Regional Harmonized Standards	0.21	0.13	0.16	0.16
% of current retail price of 50 kg bag				
ANSA Standards	0.96	0.60	0.75	0.77
Pakistan Standards		0.45		0.45
Kazakhstan Standards			0.53	0.53
Regional Harmonized Standards	0.92	0.58	0.71	0.74

COMPARATIVE ANALYSIS

A comparative analysis assessed key elements of the cost and how these vary among territories where wheat flour is produced. Key facts identified include:

- Total annual wheat flour demand is in the range of 3.5 million tons, about 70 per cent produced through small units called Chakkis. The remaining 1 million tons (30 per cent) is produced through large flour mills located in Afghanistan, Pakistan, Kazakhstan and Tajikistan. Market share of local wheat flour produced by large mills is less than 10 per cent of the total demand for wheat flour in Afghanistan
- The current value of wheat flour produced by mills and sold in Afghanistan is in the range of Afghani 32 billion per year, or USD million, using exchange rate of Afghani 67 per USD. Average per kg retail price of wheat flour for Afghanistan is assumed at 30 Afghani

- Using the average profit margin of 5 per cent stipulated in the comparative analysis, profit margins for flour millers and distribution channels is in the range of Afghani 1.6 billion per year, or USD 24 million.

The analysis points to the fact that with such small profit margins, passing the cost on to the consumer would be an important strategy to consider. It recommends that the government coordinate supply of wheat and wheat flour at government level with Kazakhstan and Pakistan together with industry players, so that wheat flour price and profits for millers can be stabilized in Afghanistan. The study says that the impact on the total household budget will be in the range of 0.1 per cent of average monthly family income.

TABLES 2, 3 AND 4: WHEAT FLOUR COMPARATIVE COST ANALYSIS

AFGHANISTAN

Cost Item					Afghanistan	
		High	Low			
Wheat Price	0.2953	81.61%	0.2000	75.03%	0.2476	66.33%
Storage Cost	0.0025	0.69%	0.0025	0.94%	0.0025	0.67%
Flour Milling Costs	0.0350	9.67%	0.0350	13.13%	0.0350	9.37%
Electricity	0.0120	3.32%	0.0120	4.50%	0.0120	3.21%
Depreciation of equipment/Mill	0.0035	0.97%	0.0035	1.31%	0.0035	0.94%
Staffing	0.0065	1.80%	0.0065	2.44%	0.0065	1.74%
Overhead	0.0130	3.59%	0.0130	4.88%	0.0130	3.48%
Packaging Cost	0.0060	1.66%	0.0060	2.25%	0.0060	1.61%
Local Taxes	0.0011	0.29%	0.0011	0.39%	0.0011	0.28%
Transportation cost	0.0160	4.42%	0.0160	6.00%	0.0160	4.29%
Labour Cost	0.0060	1.66%	0.0060	2.25%	0.0060	1.61%
Total Cost	0.3618		0.2666		0.3142	0.8415
Cost of Fortification	0.0044	1.21%	0.0044	1.65%	0.0044	1.18%
Flour Millers Margin	0.0090	2.49%	0.0120	4.50%	0.0105	2.81%
Distributor Margin	0.0055	1.52%	0.0085	3.19%	0.0070	1.87%
Retailer Margin	0.0035	0.97%	0.0055	2.06%	0.0045	1.21%
Total Margins	0.0180	4.97%	0.0260	9.75%	0.0220	5.89%
Taxes on Border	-	2.00%	-	0.00%	-	2.00%
Total Cost Potential Retail Price	0.3842		0.2969		0.3406	
Total Cost - Potential Retail Price - Local Currency	-		-		-	
			AF			
Current Retail Price in Afghanistan per kg					0.3650	

PAKISTAN

Cost Item					Cost - Pakistan	
		Average	Low			
Wheat Price	0.2953	86.34%	0.2178	82.34%	0.2565	68.71%
Storage Cost	0.0012	0.34%	0.0012	0.44%	0.0012	0.31%
Flour Milling Costs	0.0212	6.21%	0.0212	8.02%	0.0212	5.68%
Electricity	0.0096	2.81%	0.0096	3.64%	0.0096	2.58%
Depreciation of equipment/Mill	0.0020	0.59%	0.0020	0.76%	0.0020	0.54%
Staffing	0.0038	1.12%	0.0038	1.45%	0.0038	1.03%
Overhead	0.0057	1.68%	0.0057	2.17%	0.0057	1.54%
Packaging Cost	0.0038	1.12%	0.0038	1.45%	0.0038	1.03%
Local Taxes	0.0021	0.62%	0.0021	0.80%	0.0021	0.57%
Transportation cost	0.0150	4.39%	0.0150	5.67%	0.0150	4.02%
Labour Cost	0.0034	0.98%	0.0034	1.27%	0.0034	0.90%
Total Cost	0.3420	0.30	0.2645		0.3033	0.8122
Cost of Fortification	0.0021	0.60%	0.0021	0.78%	0.0021	0.55%
Flour Millers Margin	0.0030	0.88%	0.0085	3.21%	0.0058	1.54%
Distributor Margin	0.0015	0.44%	0.0065	2.46%	0.0040	1.07%
Retailer Margin	0.0015	0.44%	0.0055	2.08%	0.0035	0.94%
Total Margins	0.0060	0.01	0.0205	7.75%	0.0133	3.55%
Taxes on Border	0.0548	13.54%	0.0548	16.03%	0.0548	14.68%
Total Cost Potential Retail Price	0.4049	0.37	0.3419		0.3734	
Total Cost - Potential Retail Price - Local Currency	42.11	38.83	35.56			
			PKR			
Current Retail Price in Afghanistan per kg					0.4000	

KAZAKHSTAN

Cost Item	High		Low		Cost - Kazakhstan	
Wheat Price	0.1800	57.14%	0.1300	49.06%	0.1550	41.51%
Storage Cost	0.0035	1.11%	0.0035	1.32%	0.0035	0.94%
Flour Milling Costs	0.0475	15.08%	0.0475	17.92%	0.0475	12.72%
Electricity	0.0080	2.54%	0.0080	3.02%	0.0080	2.14%
Depreciation of equipment/Mill	0.0065	2.06%	0.0065	2.45%	0.0065	1.74%
Staffing	0.0180	5.71%	0.0180	6.79%	0.0180	4.82%
Overhead	0.0150	4.76%	0.0150	5.66%	0.0150	4.02%
Packaging Cost	0.0060	1.90%	0.0060	2.26%	0.0060	1.61%
Local Taxes	0.0060	1.90%	0.0060	2.26%	0.0060	1.61%
Transportation cost	0.0650	20.63%	0.0650	24.53%	0.0650	17.41%
Labour Cost	0.0070	2.22%	0.0070	2.64%	0.0070	1.87%
Total Cost	0.3150		0.2650		0.2900	0.7767
Cost of Fortification	0.0024	0.77%	0.0024	0.91%	0.0024	0.65%
Flour Millers Margin	0.0130	4.13%	0.0110	4.15%	0.0120	3.21%
Distributor Margin	0.0045	1.43%	0.0065	2.45%	0.0055	1.47%
Retailer Margin	0.0065	2.06%	0.0100	3.77%	0.0083	2.21%
Total Margins	0.0240	7.62%	0.0275	10.38%	0.0258	6.90%
Taxes on Border	0.0450	11.65%	0.0450	13.24%	0.0450	12.05%
Total Cost Potential Retail Price	0.3864	0.36	0.3399		0.3632	
Total Cost - Potential Retail Price - Local Currency	131.38		115.57			
			Kazakhstani tenge			
Current Retail Price in Afghanistan per kg						0.3850

OTHER CONSIDERATIONS

This costing study only covers costs which are needed to be incurred at mill level to produce quality fortified wheat flour. The cost of fortification covered in this study does not include public or private sector external quality assurance independent of millers.

Wheat flour is currently not required to be labeled. Only a few high-end wheat flour brands display the nutritional value of their products, and the author has not seen evidence to show that the product complies with the nutritional claims made on the label.

CONCLUSIONS

This study shows there is a need to identify the issues which food fortification policies must consider. This includes clarifying that cost is not an impediment to progress as it can be passed on to the consumer to make the process sustainable.

The study concludes that fortified imports from Kazakhstan are cheaper than from Pakistan or than fortifying wheat flour in Afghanistan. In 2013, Kazakhstan exported approximately 0.4 million MT of wheat flour to Afghanistan,² illustrating the potential to improve the nutritional status of the Afghan population via the fortification of imports from Kazakhstan.

Afghanistan produces approximately 3.4 m MT of wheat flour annually, of which 0.2m MT is milled by 13 major commercial mills³. Increasing the capacity of Afghan large mills to fortify wheat flour would improve the health of Afghans.

It is clear from this analysis that the cost of fortifying wheat flour with the essential micronutrients needed for life, learning and health is minimal.

² Trade Flow Analysis, Altai Report, 2015

³ Trade Flow Analysis, Altai Report, 2015

ANNEX 1: CONSULTATIONS

Documents Used

1. Afghanistan Wheat Flour Fortification Standard issued by ANSA
2. Afghanistan Oil and Ghee Fortification Standard issued by ANSA
3. Economic & Statistical Bulletin, Da Afghanistan Bank
4. National Nutrition Survey, Afghanistan 2013
3. Wheat Flour Retail Prices as of October 2016
4. Afghanistan Custom Tariff Schedule
5. Wheat flour Cost Schedule for Afghanistan
6. Wheat flour Cost Schedule for Kazakhstan
7. Wheat flour Cost Schedule for Pakistan
8. Wheat Flour Fortification Standards of Pakistan
9. GAIN's CAR Food Fortification Legislative Analysis Report
10. Altai Wheat Flour and Edible Oil Regional Trade Report

Persons Consulted

1. Mr. Halim Stanikzai, Senior Investment and Portfolio Manager, Da Afghanistan Bank
2. Mr. Khawaja Masoud, National Fortification Alliance, Pakistan
3. Mr. Munir Hussain, Secretary, Pakistan Flour Mills Association – PFMA
4. Mr. Asim Raza Ahmed, Member Executive Committee, PFMA
5. Mr. Sarfaraz Khan, flour trader, Kabul
6. Mr. Oqynous Khan, flour trader, Kabul
7. Mr. Ishaq Sikander, flour trader Kabul
8. Dr. Shahzad Afzal Deputy DG of Pakistan Standard Quality Control Authority (PSQCA)
9. Mr. Naeem Butt, Chairman Pakistan Flour Mills Association
10. Mr. Ishtiaq ,Shama Ghee Mill, KPK
11. Mr. Bakhtyar Sabarwal, Central Statistics Organization, Afghanistan
12. Dr. Khalil, Ministry of Public Health, Government of Afghanistan
13. Mr. Reshad Popal, General Director of Customs, MoF
14. Mr. Eng. Abdul Babar, Deputy ANSA
15. Mr. Abdul Rehman of Arsalan Flour Mills, Baluchistan
16. Mr. Munir Ahmed of Bilal Flour Mills, Baluchistan
17. Syed Bahauddin Darwaish of Abad Flour Mills, Baluchistan
18. Mr. Abdul Wahid of Ikram Flour Mill
19. Mr. M. Sharif of Ghaznawi Flour Mills
20. Mr. Y. Gan, President of the Association of Grain Processors of Kazakhstan

ANNEX 2: COSTING MODEL STRUCTURE

COSTING STRUCTURE

The wheat flour fortification costing model is clustered in following four sections:

- i. **Assumptions:** Based on inputs provided by related experts, current economic conditions or historic related industry trends.
- ii. **Production:** Annual production of wheat flour by flour millers has been calculated using expected annual consumption determined by multiplying per capita consumption with the population size of the target market.
- iii. **Cost Calculations:** Cost for each primary and secondary cost element is calculated for 1kg, 10kg and 20kg bags of wheat flour and 1, 3 and 5 liter containers of edible oil.
- iv. **Analysis:** Includes overall fortification cost, its impact on overall wheat flour and edible oil price and monthly financial budget of an average household.

The wheat flour fortification costing model is mainly clustered in the following four sections:

Premix costs	Micro feeder costs	Quality Assurance costs
Premix Import Price	Depreciation	Cost of Laboratory Tests
Local Import Tariff	Import	Cost of Spot Tests
Premix Transportation	Transportation	Cost of Quality Assurance Staff
Distribution Margin	Installation and maintenance	Overhead