FOOD RESEARCH INSTITUTE

(C. S. I. R.)

INVESTIGATION INTO ALLEGED POOR QUALITY FLOUR PRODUCED BY IRENI BROS. FLOUR MILLS

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1. INTRODUCTION

By a letter dated 30th November 1984, the Food Research Institute was charged by the PNDC Secretary for Industries Science and Technology to investigate and report on Ghanaian Times publication of 29th November 1984 captioned "IRANI BROTHERS TURNING OUT BAD FLOUR".

To get to the root of the issue interview sessions were held with personnel of the Social Security Bank - SSB (they provide warehousing facilities for Greater Accra Region), executive members of Greater Accra Bakers' Co-operative Association, the management and Chief Miller of Irani Brothers and Others and the personnel of Ghana Standard Board.

Information collected indicate that between the first and third week of November 1984 complaints were received from bakers to the effect that the Irani flour on the market gave very poor quality bread which did not rise, had brownish colour and bitter after - taste. It was also alleged the bread was not safe for human consumption.

Upon hearing this, SSB, suspended the release of Irani flour with effect from 29th November until assurance was given them on the wholesomeness of the flour.

2. CONCLUSIONS

- Poor quality flour was produced by Irani Flour Mills in the early parts of November 1984.
- This resulted from the use of wheat in Silos 25 and 30 storing part of original heat - damaged (poor quality) soft wheat received under the UN World Food Programme in January 1984.
- Slight deterioration of quality of wheat in these 2 silos during storage were detected.
- The Company took steps to suspend the use of wheat from these 2 silos even before the Ghanaian Times publication on the issue came out.
- All stocks of wheat and flour were found microbiologically sound and safe for human consumption. However, most are of the soft type and so are only fairly suitable for breadmaking.
- Current flour produced by Irani is fairly good for breadmaking and safe for human consumption.

3.1 RECOMMENDATIONS

- Instructions should be given for Irani flour to be released to bakers as current production has been found fairly good for breadmaking and safe for consumption.

- A fresh consignment of Canadian wheat is expected to arrive in the country on 21-22nd December 1984. With this in hand as well as the other types of wheat in stock, the Company should blend with the faulty wheat in Silos 25 and 30 in proportions that would not adversely effect the breadmaking qualities of flour eventually produced.

- As much as possible, the Government in collaboration with Ghana National Procurement Agency, should take steps to ensure that wheat consignments imported under Food Aid Programmes are reasonably suitable for breadmaking. From experience, such Aid wheats have often posed problems to the local flour mills which are supposed to produce only bread flour.

- Government action on recommendations made in the reports of the Committee on the Flour Mills set up in April - September 1984 should be hastened. Technical co-ordination of all activities in the Wheat Flour Industry would enable government to be informed at any one time of all developments and problems in the Industry.

4.0 ANALYTICAL TESTS

4.1. Physical Examination of Wheat Samples

Results of physical examination (Table 2) indicate that wheat stocks at Irani Mills as at 10/12/84 were in reasonably good state with the exception of stocks in silos 25 and 30. There were obvious signs of weevil infestation of the grain in these two silos resulting in a high proportion of insect-damaged grain and also of powdered grain. Wheat in these two silos were very dark in colour with a musty scent. The consignment of wheat in Silo 15, 25 and 30 are German soft wheat supplied under the UN World Food Programme in January 1984.

4.2 Chemical Tests

Moisture content of flour and wheat samples ranged from 10.5% to 13.0% which are normal safe levels for storage under Ghanaian climate conditions (Table 3). The Canadian hard wheat - CWRS No.1 (see also Table 1) was found to be the best wheat in stock as at 10/12/84, with a protein content of 13.6%.

4.3 Microbiological Tests on Wheat and Flour Samples Collected from Irani Flour Mills

Table 4 gives details of results of microbiological test carried out on two (2) flour samples (rejected and improved) and seven (7) wheat samples to determine whether they are safe for human consumption. Microbial load of each sample tested was found within acceptable limit of safety. No pathogenic organisms were isolated from any of the samples examined. All samples were therefore found microbiologically safe and do not pose health hazard

4.4 Baking and Organoleptic Tests

To determine the suitability of Irani flour for breadmaking, samples of flour collected from bakers, Social Security Bank warehouse and Irani Factory were subjected to standardised baking tests and taste panel assessment. Table 5 shows that out of 7 samples tested only 2 (IR2 and SSB1) gave bread of fairly good quality. These two flour samples (from Irani mills and SSB warehouse) were produced after the latter part of November 1984 when steps had been taken by the company to improve the quality of flour.

Results of taste panel assessment also indicated that only the two samples of flour mentioned above gave bread of fairly acceptable eating characteristics. All samples of flour collected from bakers (B1-B4) and a sample of rejected flour from the Irani mill (IR1) gave unacceptable bread with low volume, rancid aroma, bitter after taste and gummy texture.

TABLE I

STOCKS OF WHEAT AT IRAN MILLS AS AT 10/12/84

Stock of Wheat as at 10/12/84	Type of Wheat	Date of Arrival	Name of Vessel	Remarks
1500 mt	'Ex special' hard Wheat from Canada	November 1983	Jill Cord	Poor bread-making quality
2500 mt	Soft German Wheat	January 1984	Nordic Trader	Received under UN World Food Programme. Stored in Silos 15, 25, & 30. Samples from Silos 25 & 30 were found to have deteriorated considerably in quality during storage thus contributing to very poor quality flour produced during November 1984.
1200 mt	Canadian Hard Red Spring (CWRS No.1)	March 1984	Federal St Laurent	Very good quality wheat for bread-making.

TABLE 2

PHYSICAL EXAMINATION OF WHEAT SAMPLES
COLLECTED FROM IRANI MILLS

SAMPLES	FOREIGN MATTER %	BROKEN GRAIN %	INSECT DAMAGED GRAIN %	COLOUR	ODOUR
German Soft Wheat (WFP) in Silo 15	0.3	8.3	Negligible	dark	Slight
German Soft Wheat (WFP) in silo 25	0.3	9.2	10.0	dark	musty
German Soft Wheat (WFP) in Silo 30	0.4	8.0	15.0	very dark	very musty
Canadian Hard Wheat (CWRS No. 1)	0.7	2.3	Nil	normal	normal
Canadian "Ex special Wheat	1.1	3.1	Nil	dark	normal

TABLE 3

CHEMICAL TESTS ON WHEAT AND FLOUR SAMPLES (as-is)

SAMPLE NO.	SAMPLE IDENTIFICATION	MOISTURE %	ASH %	PROTEIN % (N x5.7)
S1	Current Flour	10.5	0.60	10.5
S2	Rejected Flour	11.9	0.75	10.1
S3	German Soft Wheat (WFP) in Silo 15	12.0	1.55	10.2
S4	Canadian Hard Wheat (CWRS I)	12.4	1.67	13.6
S5	Canadian "Ex Special" wheat	12.1	1.73	12.0
S7	German Soft Wheat (WFP) in Silo 25	12.2	1.48	10.0
S9	German Soft Wheat (WFP) in Silo 30	13.0	1.53	9.5

TABLE 4

MICROBIOLOGICAL EXAMINATION OF WHEAT AND FLOUR SAMPLES

SAMPLE NO.	VIABLE ORGANISMS/G (AEROBIC)		CULTURE	COLIFORMS	FAECAL COLI	PATHOGENS
	BACTERIA COUNT	MOULD & YEAST COUNT				
S1	200×10^2	3×10^1	Bacillus spp. Mucor sp. G	Nil	Nil	Nil
S2	104×10^2	6×10^1	"	Nil	Nil	Nil
S3	108×10^1	3×10^1	"	Found in 0.1g	Nil	Nil
S4	68×10^1	4×10^1	"	Nil	Nil	Nil
S5	279×10^2	2×10^1	"	Nil	Nil	Nil
S6	236×10^2	40×10^1	"	Nil	Nil	Nil
S7	288×10^2	12×10^1	"	Found in 0.1g	Nil	Nil
S8	130×10^2	45×10^1	"	Nil	Nil	Nil
S9	250×10^4	2×10^1	"	Found in 0.1g	Nil	Nil

Key:

S1 = Current flour

S2 = Rejected flour produced at beginning of November 1984

S3 = German Soft Wheat (World Food Programme WFP) in silo 15

S4 = Canadian hard wheat (CWRS No. 1)

S5 = Candian "Ex Special" wheat

S6 = Blend of wheats S3, S4 & S5 in 1:1:1 ratio, used for the production of flour S1

S7 = German Soft Wheat (WFP) in Silo 25

S8 = Blend of wheats S7, S4, & S5 in ratio 1:1:1, used for the production of flour S2

S9 = German Soft Wheat (WFP) in Silo 30.

TABLE 5

QUALITY EVALUATION OF BREAD PREPARED FROM SAMPLES OF IRANI FLOUR COLLECTED FROM BAKERS, SSB AND IRANI FLOUR MILLS

No. of Loaf		IR 1	IR 2	B 1	B 2	B 3	B 4	SSB 1
Wt of loaf	g	117	114	119	117	118	120	108
Volume	cc	280	410	285	270	285	240	400
Specific Vol.	cc/g	2.4	3.6	2.4	2.3	2.4	2.0	3.7
Score of Loaf								
Volume	20	8	15	8	7	8	6	16
Crust colour	10	3	7	3	4	4	3	4
Symmetry	10	3	8	2	3	3	2	7
Break & Shred	10	2	7	2	2	2	2	6
Grain	20	4	10	3	3	2	3	11
Crumb Colour	10	2	4	2	2	2	2	4
Texture	20	3	10	4	3	4	3	10
Total Score of Loaf	100	25	61	24	24	25	22	58

KEY:

IRI = Rejected flour from Irani Mill

IR2 = Improved flour from Irani Mill

B1-B4 = Flour samples from bakers (Gt. Accra Co-op)

SSB1 = Flour sample from Social Security Bank Warehouse)

Organoleptic Tests:

	IRI	IR2	B1	B2	B3	B4	SSB1
Aroma	U	FA	U	U	U	U	FA
Taste	U	FA	U	U	U	U	FA
Chewability	U	FA	U	U	U	U	FA
Acceptability Rating	U	FA	U	U	U	U	FA

KEY:

U = Unacceptable characteristics

FA = Fairly acceptable characteristics