PROCEEDINGS OF THE
ANNUAL GENERAL MEETING 1991

The First Annual General Meeting of the Pakistan Society of Food Scientists and Technologists was held on May 11, 1991 at the University of Agriculture, Faisalabad. It was initiated in a most befitting manner by the celestial recitation from the Holy Quran by Mr. Izhar ul Haq followed by a *'naat'* by Mr. Nasir Hameed. The Secretary of the Society, Dr. Javaid Aziz Awan welcomed the Chief Guest, Dr. Abdur Rehman, T.I., Vice-Chancellor University of Agriculture, Faisalabad and the delegates. The day's deliberations were divided into 3 sessions: inaugural, technical and business.

I. INAUGURAL SESSION

The inaugural session was chaired by the Chief Guest, Dr. Abdur Rehman, T.I. It was formally opened by the President's Keynote Address. The President of the Pakistan Society of Food Scientists and Technologists, Prof. Dr. M. Shafiq Chaudhry, welcomed all the members who had come to participate in the meeting. He highlighted some problems and issues which faced the food industries. He also stressed the need to critically evaluate the curricula of food technology in various universities and urged for revising the existing food laws.

In his inaugural address, the honourable Vice-Chancellor, lauded the revival of the Society, which had existed, but was allowed, by default or design, to fall into disarray. He laid emphasis on the significance of food science and technology on the health of the nation and the society.

II. TECHNICAL SESSION

The technical session was chaired by Prof. Dr. Mohammad Saeed who was assisted by Mian Abdul Malik and Dr. Mumtaz Ali.

Following papers were presented:

1. Food contamination by Dr. F.H. Shah, Rtd. Director General, P C S I R Laboratories, Lahore.

2. Status of oil and fat industry in Pakistan by Dr. Amjad Ali, Chairman, Department of Food Technology, University of Agriculture, Faisalabad.

3. Research activity on post-harvest technology at NIAB by Dr. W.A. Farooqi, Principal Scientific Officer, Nuclear Institute for Agriculture and Biology, Faisalabad.

4. Food Technology in the N.W.F.P. by Prof. Dr. M. Saeed, Chairman, Department of Food Technology, NWFP University of Agriculture, Peshawar.

Full text of the papers will be published in Food Science News starting with this issue.

III. BUSINESS SESSION

This Session was chaired by the President, Prof. Dr. M. Shafiq Chaudhry who was assisted by the Vice-President, Dr. Mumtaz Ali and the Secretary, Dr. Javaid Aziz Awan. The members aired their views on the operations of the Society and agreed unanimously on the following issues:

a. Chapters should be opened in various cities in accordance with the existing by-laws.

b. The membership dues be increased to the following for the various categories:

i.	Professional Members	Rs. 100.00
ii.	Associate Members	Rs. 100.00
iii.	Student Members	Rs. 50.00

c. Article IV, Membership Section 2c be amended to read as follows:

"a person who holds a Bachelor's degree and has had a minimum of five years experience in food technology and holds a responsible position therein, or"

d. Introduce courses in food engineering in the curricula of various universities.

At the end the Secretary thanked the participants who had come from all over Pakistan to participate in this meeting. He also paid tribute to the enthusiasm shown by the students of the Department of Food Technology, University of Agriculture, Faisalabad in making the arrangements. Special thanks were given to Crescent Boards Ltd., (Faisalabad), M/s Synarome Manufacturing Co. (Pvt) Ltd., (Lahore), Yummy Foods, (Lahore) and the Punjab Beverages Faisalabad for their cooperation. He wished the delegates a happy and safe journey home.

KEYNOTE ADDRESS

It is my most pleasant duty to welcome the Chief Guest, Dr. Abdur Rehman Chaudhary, Vice-Chancellor, University of Agriculture, Faisalabad and the delegates to this First Annual General Meeting of the Pakistan Society of Food Scientists and Technologists. I have been asked to present a keynote (dictionary meaning - comprehension) address. When I look at the vastness of the subject of Food Science and Technology, I find myself lacking in dealing with all its aspects. I, have therefore, decided to limit my presentation to the development of food industries in Pakistan and to highlight some problems/issues which face them.

Developments in Food Processing Industries

Food industries were practically non-existent at the time of creation of Pakistan. There was one sugar mill at Rahwali, Mitchell's fruit preserving unit at Renala Khurd, one or two ghee mills and a few flour mills. Over the years, Pakistan has developed broad and diversified industrial base which has made a definite impact on the food processing industries. According to a report of the Ministry of Finance, Government of Pakistan, there were 494 food processing industries in the country in 1984-85. This number must have increased significantly by now. As, for example, there were only 10 bread manufacturing factories in the country in 1984 and the number has swelled to more than 40 by the end of 1990. This phenomenal growth has been made possible by the liberalization of credit facilities by the Government as well as the availability of locally fabricated machinery and equipment for this industry. Full range of equipment required for the manufacture of sugar, hydrogenated shortening, potato chips, 'Nimko', snacks, etc. are being fabricated locally. In addition, stainless steel tanks with and without stirring mechanism, liquid filling machines, powder filling machines, pulpers, pasteurizers, vibrating screens, hammer mills and components for many other food processing industries are also being fabricated locally. These developments have been made by individual private entrepreneurs. There is a strong need for encouragement and patronage by the Government.

Education

Formal education in Food Technology started in 1960 when undergraduate and graduate courses were introduced in the B.Sc. Agriculture curriculum in the then Punjab Agricultural College and Research Institute, Lyallpur. This College was elevated to a University in 1961. In subsequent years, under- and post-graduate courses were introduced at the University of Agriculture, Tandojam, Sindh and NWFP Agricultural University at Peshawar. Now, besides these institutions food technology is being offered at Gomal University, Dera Ismail Khan, College of Agriculture, Rawalakot, Barani Agricultural College Rawalpindi and University of Karachi, Karachi. I feel that there is a need to make a critical evaluation of the courses being taught at each of these institutions and determine their equivalence. It might be in order to form a Curriculum Committee which should draw its members from all the Universities and from some representative industries. The graduates in Food Technology have held responsible positions in the food industries, research and teaching institutes. I have often been asked about the availability of first line supervisors for various industries. Only one institution, College of Technology, Faisalabad, is producing such manpower. There is a need for the institution of short duration practical oriented courses specially suited for various food industries.

Raw Material for the Food Industries

Virtually all food industries are faced with the problem of variability in the quality of raw material available to them. There is not a single instance where any raw material of specific characteristics as required by a food processing industry is being produced. The industry has to process what ever becomes available, which often results in variation in the finished goods. There is a definite need to develop varieties of crops specifically suited to the needs of food industries. In crops like wheat, procurement and storage should be done according to zones of production. Our experience has shown that wheat produced in central and southern districts of Punjab and Sindh is of better quality as compared to other regions.

Pure Food Laws

These laws were formulated in the 1960s at which time the number and quantity of processed foods was very small. With the passage of time, the number of processed foods in the market has grown and so has their volume. The standards of identity of many such foods have not been included in the Pure Food Laws. The collection, transportation, storage of and analysis of food samples by officers of government departments and municipal corporations is far below the desired standards. The facilities provided for the analysis of food samples in the laboratories of municipal corporations or committees are grossly inadequate. Interest in this field has been shown in public and private sectors recently. A National Seminar on Food Safety and Nutrition was held at the PCSIR Laboratories Complex, Lahore and another two-days Seminar was arranged by the Mayor Lahore Metropolitan Corporation in the early part of this year. On both occasions, participants endorsed the need for revision and updating of the present food laws. It was further recommended at the latter Seminar that a Quality Control Directorate be established at the Provincial level for revision, updating and implementation of Pure Food Laws and further to coordinate the activities of similar organizations in other provinces.

With these words, I conclude my address. I do wish you all a happy stay at Faisalabad.

Prof. Dr. M. Shafiq Chaudhry
President
Pakistan Society of Food Scientists and Technologists

INAUGURAL ADDRESS

President, Pakistan Society of Food Scientists and Technologists, Distinguished Faculty Members, Guests, Ladies & Gentlemen!

It is a matter of great pleasure for me to spend a few moments in this assembly of academics, scientists and professionals. I sincerely compliment the organizers, or should I say the messiahs, who are trying to breath a new life into a society which, I understand once existed but was allowed, by default or design, to fall into disarray, to wither away, and to disappear into a state of limbo. The renewed efforts to bring it back to life, I am sure, are being made with good intentions, to serve the best interests of the science, art and technology involved in this field.

Food science and technology is an area whose importance in human health, and the health of the nation, both in literal and socio-economic terms, needs no overemphasis. In universities, it is recognized and treated as an elite discipline. Graduates passing out with Food Science and Technology as their major specialization once commanded attractive premium in the job market, compared with their counterparts in many other fields. I wonder if the same is true today, which it should be, as I see a rising awareness and interest in our industrial circles for a more imaginative exploration of the opportunities available, in plenty, in food industry and trade.

Food science, technology and industry is a multidimensional complex embracing many disciplines and crossing several variables. The natural motive and purpose of a society, such as this one, is to provide a forum for a frequent exchange of views, between its various component parts and to articulate the vital issues for the information of public at large, professional experts and Government, in order to promote the legitimate interests of this organization which is nothing else but service to science and industry it has committed itself to.

Food supply position in our country, in spite of significant advances made over the years in productivity, still leaves a lot more to be achieved to assure self-sufficiency, particularly in the food commodities in which our dependence on foreign imports is desperately lingering on. In this scenario, your contribution as food scientists, technologists and industrialists is all too obvious in matters of food processing, preservation and marketing. The problems are many and well known, the strategies you will have to come up with to come to grips with them. And that is the crux of the challenge before you.

On another occasion, in a similar function I had expressed my apprehensions that galloping ambitions on the part of some and indiscipline and imprudence indulged in by others in a society for personnel ends, can degrade the society to a house divided against itself, reducing it to a disgraceful position. So watch your steps, please be alert and let not this happen to your society. I am sure, the proceedings of this conference will be purposeful and inspiring enough to sustain, on a continuing basis, the interest of the participants and give them a sense of satisfaction in being associated with it.

With these few words, I wish this meeting godspeed.

Pakistan Zindabad

Dr. Abdur Rehman, T.I.,
Vice Chancellor,
University of Agriculture,
Faisalabad-Pakistan.

May 11, 1991 at 9.30 a.m. at **Central Seminar Hall.**

FOOD CONTAMINATION

F.H. Shah
Ex-Director General,
PCSIR Laboratories, Lahore.

INTRODUCTION

Rapid and unplanned industrialization of the country, improper disposal of municipal wastes, indiscriminate use of pesticides and fertilizers, adulteration by food handlers and inadequate storage facilities have created a large number of problems for human beings and for livestock production. Whereas industrial effluents and municipal wastes are adding heavy metals to the irrigation channels which contaminate foodstuffs and plants, heavy dosage of fertilizers and pesticides leave their residues which are carcinogenic and are hazardous. Improper storage conditions encourage propagation of toxigenic strains of *Aspergillus flavus* which produce highly potent toxins, responsible for mortality and morbidity in case of livestock and liver damage and cancerous growth in human beings. I shall review the contamination of foods with metal and other contaminants.

Foodstuffs were purchased from local markets and through Food Inspectors of the Governments of the Provinces. Canned foods and hydrogenated fats of local brands were purchased from the local markets.

Heavy metals were determined, after digestion, with Atomic Absorption Spectrophotometer (Hitachi, 170-10)[1]. Nitrates were spectrophotometrically determined by Nitroxylenol method[2], while sulfanilimide colour reagent[3] was used for nitrite determination. Aflatoxins were extracted by different solvent combinations and estimated by Mini-column Procedure[4].

RESULTS AND DISCUSSION

Lead

Lead content of various foodstuffs are shown in Tables 1 and 2. It varied from 0.15 ppm in coriander to as much as 65.00 ppm in turmeric. The high amount of lead in turmeric seems to be due to treatment of the tubers with lead chromate to improve their colour. Cereals, except oats, also contained substantial amounts of lead. As most of the population derives its energy as well as proteins from cereals, the ingestion of lead can have a cumulative effect on the health of the masses. Lead contents of jams, jellies and other products of fruits were invariably higher than the permissible limits of 3 ppm. The amount of lead was more in the canned products than in those preserved in glass bottles (Table 2). This seems to be due to the use of solder, which contains lead, for sealing of the cans.

Toxicity of lead to various enzyme systems was reported by Friberg *et al.*[5]. Impairment of nervous system, malfunctioning of kidneys and bone marrow, convulsive seizures, coma and death were reported to be cumulative effects of lead ingestion. Gilani[6] reported malformed mitochondria, disorganized, short and scanty myofibrils and abundance of swollen vacuoles in the ventricles of chick embryos administered with 0.15 mg/egg of lead acetate. Ultra-structural changes were demonstrated in endocardial cushion tissues of the developing heart in lead poisoning by Gilani[7].

Cadmium

Cadmium contents of cereals, pulses and spices are depicted in Table 1. The amount varied from 4.5 ppm to 133 ppm, whereas the permissible limits are 5.5 ppm. Again, cereals contained high amounts of the metal and daily consumption of contaminated cereals can be a health hazard. Indiscriminate use of insecticides and untreated effluents of the chemical industries seem to be the major sources of cadmium.

Cadmium is a toxic element that has no known function. Its in-

Table 1. Lead and Cadmium contents of some food commodities

Food commodities	Lead (ppm)	Cadmium
Wheat	1.22 - 4.05	19.40 - 89.40
Rice	0.17 - 4.90	6.66 - 48.64
Maize	0.17 - 4.90	13.20 - 92.00
Oats	0.60 - 1.00	43.20 - 101.43
Rainfed sugar/Jaggery	0.23 - 1.06	
Gram	0.17 - 3.60	7.10 - 48.00
Moong (Green Gram)	0.34 - 2.80	4.40 - 107.40
Masoor (Lentil)	0.35 - 3.17	13.20 - 105.60
Mash (Black Gram)	0.34 - 1.50	8.80 - 66.00
Chillies	0.62 - 1.76	24.20 - 87.00
Coriander	0.15 - 1.60	11.20 - 133.00
Turmeric	40.50 - 65.00	21.50 - 26.70
Cumin	1.20 - 2.30	20.10 - 33.14

toxication becomes detectable when it exceeds the threshold level of 57-71 μg/day[8]. The adverse effects of high exposure include depressed growth rate, anaemia, hypertension, damage to renal tubules and poor mineralization of bones[9].

Table 2. Lead content of some canned and bottled fruit products

Fruit product	Lead	
	Tin can	Glass jar
Apple jam	7.50	3.25
Apple jelly	9.67	4.50
Mango jam	9.25	4.15
Plum jam	9.25	4.75
Mixed fruit jam	8.50	3.50
Marmalade	9.50	4.25
Pear halves	8.70	-
Peach halves	8.70	-
Fruit salad	7.50	-

Mercury

Mercury contents of two cereals irrigated by tubewell, canal and municipal sewage show a heavy contamination (Table 3). It was maximum in case of sewage irrigated crops. Mercury is a highly toxic food contaminant. It enters the environment through several means, including burning of fossil fuels. Mercury is also discharged into waterways by chemical industries[10]. Industrial and agricultural uses of mercury and its compounds have resulted in widespread occurrence of this metal in the environment. Production of one tonne of caustic soda results in a loss of approximately 300 grams of mercury in the form of its salts. These salts are being put into open drains.

Table 3. Mercury content of some cereals

Cereals	Irrigation water used	Mercury (ppm)
Maize *(Zea mays)*	Municipal sewage	15.0 - 28.8
	Canal water	13.0 - 22.0
	Tubewell water	12.0 - 20.0
Oats *(Avena sativa)*	Municipal sewage	18.0 - 31.0
	Canal water	14.0 - 26.0
	Tubewell water	14.0 - 25.0

Table 4. Nickle content of vegetable ghee*

Ghee brands	Nickle (ppm)
A	0.12 - 2.41
B	0.74 - 1.30
C	0.56 - 0.75
D	0.55 - 0.61
E	0.74 - 0.75
F	4.27 - 5.38
G	0.72 - 5.38
H	0.53 - 0.74
I	0.93 - 2.60

*Max permissible limit = 0.2 ppm.

Mercury has been reported to damage chromosomes. Chronic intoxication of mercury has been found to depress activity of various enzymes. Mercury and its compounds have been reported to be mutagenic and embryotoxic[11].

Nickel

Nickle contents of vegetable ghee varied from 0.12 ppm in brand A to 5.38 ppm in brands F and G (Table 4), the maximum permissible limit being 0.2 ppm.

Table 5. Aflatoxins in agricultural commodities

Sample	Locality	No. of samples estimated	No. of samples contaminated with aflatoxins (%)	Concentration of aflatoxins μg/kg
Maize & Maize flour *(Zea mays)*	Punjab	53	14	133 - 800
Roasted peanuts *(Arachis hypogea)*	Punjab & Balochistan	50	12	24 - 800
Pistachio nuts *(Pistachio vera)*	Punjab & Balochistan	2	50	200
Walnuts *(Juglans regia)*	Punjab	28	21	80 - 400
Dried bread	Punjab	3	33	33 - 640
Cotton seed cake	Punjab	128	6	24 - 160
Sunflower cake	Punjab	3	66	24 - 200

Note: EEC has set a tolerance range of 20-25 g/kg[12].

Cont'd on P/15

Cont'd from P/10

Food and fodder are contaminated with nickle through soil, water and fall-out from polluted atmosphere. Disposal of industrial wastes into waterways and adjacent land contaminates the water and soil to a considerable extent[21-24].

Nickle is an essential trace element for human, as well as animal health[19]. In living systems, it is associated with DNA and RNA molecules and is also a regulatory element for various enzyme systems[20]. However, these biochemical requirements of nickle are small and excessive intakes of nickle produce delcterious effects such as blindness, both in human and animals[25], respiratory tract disorders[27], increased blood-sugar level and serum cholesterol[28], and local necrosis in liver tissues[29].

CONCLUSIONS

It is evident from the facts mentioned that food in Pakistan is being contaminated, intentionally or unintentionally, to a high degree in several cases. This needs immediate attention because human health is likely to be affected. A combination of preventive measures and suitable legislation as well as increased public awareness is required.

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NOTICE

ANNUAL GENERAL MEETING, 1992

The Annual General Meeting of the Pakistan Society of Food Scientists and Technologists is scheduled to be held on Thursday, April 23, 1992 in the University of Agriculture, Faisalabad. The Inaugural Session will begin at 9.00 a.m. followed by Technical Session. The Business Meeting of the Society will take place the same day in the afternoon. All the food scientists/technologists and those actively engaged in food processing are cordially invited to attend.

Detailed information may be obtained from:
Secretary,
Pakistan Society of Food Scientists
and Technologists,
C/o Department of Food Technology,
University of Agriculture, Faisalabad-Pakistan.
Phones: 0411-25911-19 Ext. 334.

Dr. Saeed elected as Director, PSFST (NWFP)

Members of the Pakistan Society of Food Scientists and Technologists of the NWFP province have unanimously elected Professor Dr. Muhammad Saeed as Director, NWFP. Dr. Saeed is already Coordinator for the Peshawar region and is very actively involved in the affairs of the Society. We congratulate Dr. Saeed on the confidence which the Food Scientists and Technologists have placed in him and look forward to more activities in the province.

PSFST condoles

Following members of Pakistan Society of Food Scientists and Technologists have expired.

1. Mr. Mubarik Ali - graduated from the University of Agriculture (WPAUL) in 1962 and worked in food industries in Pakistan and Middle East.

2. Mr. Muhammad Iqbal - graduated from the University of Agriculture, Faisalabad (WPAUL) in 1962. He performed in various disciplines in food industry in Pakistan.

3. Mr. Munawar Ahmad - graduated from the University of Agriculture, Faisalabad in 1986. Since completing his Masters degree in 1988, he suffered from cancer of the tongue and expired in June, 1991.

4. Abdul Kabir Qureshi - graduated from the University of the Punjab, Lahore in 1961. He worked in various food industries in Pakistan and has written numerous papers in scientific journals on milk and dairy industry. Mr. Qureshi died in September, 1991.

5. Dr. M. Aslam Mian - graduated from the University of Agriculture, Faisalabad in 1968. He performed in Food Technology Section, Ayub Agriculture Research Institute, Faisalabad and passed away in December, 1991.

6. Raja Jamil Yousaf - graduated from the University of Agriculture, Faisalabad and joined his Masters degree. He was a student of M.Sc. in the Department of Food Technology, University of Agriculture, Faisalabad.

Pakistan Society of Food Scientists and Technologists condoles the sad demises of its valued members and expresses its profound sense of grief on the untimely deaths of the deceased, and prays that may Allah in His infinite mercy grant peace to the departed souls and strength to the bereaved families to bear the irreparable loss.

NEW MEMBERS

PROFESSIONAL MEMBERS

Abdul Aziz
Assistant Food Technologist
Vegetable Research Institute,
Ayub Agricultural
Research Institute,
Faisalabad-Pakistan.

Abdul Moeed Hashmi
Assistant Professor,
Department of Food
Technology,
University of Agriculture,
Faisalabad-Pakistan.

Abdul Razzaq
Quality Control Officer
(Consumer Food Products)
Rafhan Maize
Products Co. Ltd.,
P.O. Box 62, East Road,
Rakh Canal, Faisalabad-
Pakistan.

Abdul Waheed
Chief Chemist
Rafhan Maize Products Co.
Ltd.,
P.O. Box 62, East Road,
Rakh Canal, Faisalabad-
Pakistan.

Adeel Ahmed Aali
Quality Assurance Officer
Milkpak Ltd., 40/A,
Off. Gulberg, Zafar Ali Road,
Lahore-Pakistan.

Altaf Akbar Khan, Dr.
Food Technologist
Directorate of Food,
Government of Punjab,
Lahore-Pakistan.

Amjad Mehmood Khakwani
Manager
Agricultural Development Bank
of Pakistan, Ahmad Pur East,
District Bahawalpur-Pakistan.

Ata-ur-Rehman
Assistant Research Officer,
Food Technology Section,
Ayub Agricultural Research
Institute,
Faisalabad-Pakistan.

Ateeq-ur-Rahman
E-250/8, Satellite Town,
Rawalpindi-Pakistan.

Atta Mohammad Naz
Manager,
Saba Food Products,
G.T. Road, Khayaban Sir Syed,
Rawalpindi-Pakistan.

Aurangzeb Jadoon
Production Manager,
Modern Food Industries,
32-I-9, Islamabad-Pakistan.

Bilal Raza Khan
P-1, Muhammadpura,
Faisalabad-Pakistan.

Ch. M. Amin Javed
Assistant Research Officer,
Food Technology Section,
Ayub Agricultural Research
Institute,
Faisalabad-Pakistan.

El-Tahir Mohammad
Wida Tallah
Food Inspector
Food Control Section,
Health Department,
Dubai Municipality,
Dubai, U.A.E.

Hamid Ahmad
Principal Scientific Officer,
Biotechnology and Food
Research Centre,
P.C.S.I.R. Laboratories
Complex,
Lahore-54600, Pakistan.

Irfan Safdar Khan
Deputy Director,
Project Appraisal Department,
Agricultural Development Bank
of Pakistan,
Islamabad-Pakistan.

Irshad Ahmed Khan
Assistant Research Officer,
Vegetable Research Institute,
Ayub Agricultural Research
Institute,
Faisalabad-Pakistan.

Ismail Khan, Dr.
Director,
Nuclear Institute for
Food and Agriculture (NIFA),
P.O. Box 446,
Peshawar-Pakistan.

Izhar H. Akhtar
Senior Sceintific Officer,
Animal Sciences Institute,
National Agricultural Research
Centre,
Park Road, Islamabad-
Pakistan.

Javed Sadiq
Production Officer,
Roti Corporation of
Pakistan (Pvt) Limited,
Roti Plant, Islamabad-Pakistan.

Khalid Mahmood Sabir
Assistant Research Officer,
Wheat Research Institute,
Ayub Agricultural Research Institute,
Faisalabad-Pakistan.

M. Aslam Sagar
Senior Scientific Officer,
Pakistan Agricultural Research Council,
Islamabad-Pakistan.

M. Najam Qureshi
General Manager
Tops Food and Beverages
Murree Brewery Company,
National Park Road,
Rawalpindi-Pakistan.

M. Sadiq Shamim Ch.
Factory Manager
Roti Corporation of Pakistan (Pvt) Limited,
45-50 Industrial Area,
Gulberg-III, Lahore-Pakistan.

Maqbool Ahmad
Process Supervisor
Rafhan Maize Products Co. Ltd.,
P.O. Box 62, East Road,
Rakh Canal, Faisalabad-Pakistan.

Mian Aslam Pervez
Managaer Production
Vita Food Industries (Pvt) Ltd.
12th Km, Multan Road,
Lahore-Pakistan.

Mohammad Afzal
Product Manager
Chemoflor Distributors,
P.O. Box 5438,
Karachi-74000, Pakistan.

Mohammad Akram
Process Supervisor
Rafhan Maize Products Co. Ltd.,
P.O. Box 62, East Road,
Rakh Canal, Faisalabad-Pakistan.

Mohammad Akram Saeed
Managing Director
Barkat Food Industries,
S.I.E., Bahawalpur-Pakistan.

Mohammad Amin
Development Chemist
Rafhan Maize Products Co. Ltd.,
P.O. Box 62, East Road,
Rakh Canal, Faisalabad-Pakistan.

Mohammad Asghar Bajwa
Lecturer
Department of Chemistry,
University of Agriculture,
Faisalabad-Pakistan.

Mohammad Asif Khan
Deputy Production Manager
Fauji Cereals
P.O. Box 57, Dhamial Camp,
Rawalpindi-Pakistan.

Mohammad Aslam
Chairman
Technology and Industrial Consultant
670/10, Federal B-Area,
Karachi-Pakistan.

Mohammad Aslam Shaheen
Research Officer,
Nutrition Section,
Planning and Development Division,
Secretariat, Engineer's Building,
G-8/1, Islamabad-Pakistan.

Mohammad Asrar Kayani
Lecturer
Barani Agricultural College,
Murree Road, Rawalpindi-Pakistan.

Mohammad Haroon
Director
Standard Manufacturing Co. (Pvt) Ltd.
Al-Hayat Chambers,
Sultan Ahmad Shah Road,
Karachi-Pakistan.

Mohammad Rafiq Choudhry
Production Manager
Pakistan Dairies Ltd.,
P.O. Box 23,
Sahiwal-Pakistan.

Mohammad Riaz Chohan
Advisor/Management Exceutive,
Vety Care (Pvt) Limited,
Murree Road,
Rawalpindi-Pakistan.

Mohammad Sabir Ali, Dr.
544-A, Al-Manzoor,
Ghulam Muhammad Abad,
Faisalabad-Pakistan.

Mohammad Sajjad
Chief Chemist
Phalia Sugar Mills, Phalia,
Distt. Gujrat, Pakistan.

Mohammad Wahid
Senior Scientific Officer,
Nuclear Institute for Food and Agriculture (NIFA),
Tarnab, Peshawar-Pakistan.

Muhammad Aslam Mian, Dr.
Food Technologist
Post-Harvest Research Centre,
Ayub Agricultural Research Institute,
Faisalabad-Pakistan.

Muhammad Imran Al-Haq
Lecturer
Barani Agricultural College,
Murree Road, Rawalpindi-Pakistan.

Muhammad Mansoor Baqir
Chief Executive
Danish Foods (Pvt) Ltd.,
22-Multan Road,
Chowk Chouburji,
Lahore-Pakistan.

Muhammad Mushtaq Ahmad
Assistant Research Officer
Food Technology Section,
Ayub Agricultural Research Institute,
Faisalabad-Pakistan.

Muhammad Naveed Aslam
Assistant Research Officer
Sugarcane Research Institute,
Ayub Agricultural Research Institute,
Faisalabad-Pakistan.

Mumtaz Hussain, Dr.
Project Officer
Preserved Foods Production Division,
MGO Welfare Centre,
C/o Central ITD
Laboratory, Chaklala,
Rawalpindi-Pakistan.

Munawar Hussain
Assistant Production Manager
Bambino Food Industries,
Jampur Road, Dera Ghazi Khan.

Muneer A. Hamdani
Factory Manager
M/s Peracha Food Industries,
Abdullahpur, Faisalabad-Pakistan.

Naeem Haider
Friends Services,
150-Bank Square Market,
Model Town, Lahore-Pakistan.

Naeem Khalid
Assistant Research Officer
Food Technology Section,
Ayub Agricultureal Reaearch Institute,
Faisalabad-Pakistan.

Naeem-ul-Islam Qureshi
Production Manager
Malik Food Industries,
Kot Lakhpat, Lahore-Pakistan.

Nasar Farooq Sajid
Safeway Bakers,
Block 1-T, F-10 Markaz,
Islamabad-Pakistan.

Nasim Ahmed
Lecturer
Department of Chemistry,
University of Agriculture,
Faislabad-Pakistan.

Qaiser Mustafa
Manager Production
Langar Sulaimani Industries Ltd.,
11-Z, Model Town,
D.G. Khan-Pakistan.

S. Irshad Hussain Tirmzi, Dr.
Deputy Educational Advisor
Ministry of Education,
Science and Technology Wing,
Shaheed-i-Millat Secretariat,
Islamabad-Pakistan.

Sabir Zameer Siddiqi
Cereal Technologist
Wheat Research Institute,
Ayub Agricultural Research Institute,
Faisalabad-Pakistan.

Sajid Hussain Malik
Production Manager
Continental Baking Industries (Pvt) Limited, Chaklala Road,
Rawalpindi-Pakistan.

Shafeeq-ur-Rahman
Coordination Manager
M/s Chemoflor Distributors
Al-Hayat Chamber, A-7,
Sultan Ahmed Shah Road,
Karachi-Pakistan.

Shafiq-ur-Rehman
Assistant General Manager
Savola Co., P.O. Box 30439,
Jeddah 21447, Saudi Arabia.

Shahzad Nasim
Assistant Analyst
Rafhan Maize Products Co. Ltd.,
P.O. Box 62, East Road,
Rakh Canal, Faisalabad-Pakistan.

Syed Aftab Hussain Bukhari
House No. 126-A, Block-I,
Ward No. 12, Abid Shaheed Road,
Tandlianwala, District Faisalabad.

Syed Asif M. Rizvi
Manager Marketing
Synarome Manufacturing Co. Pvt. Ltd.,
1st Floor, Qartaba Complex,
8-Jail Road, Lahore-Pakistan.

Tahir Anis
Product Manager
Standard Manufacturing Co. (Pvt) Ltd.
4-Diyal Singh Mansion,
Shahrah-i-Quaid-i-Azam,
Lahore-Pakistan.

Umed Ali
Managing Director
Prime Foods (Pvt) Ltd.,
G 5/A, S.I.T.E.,
Hyderabad-Pakistan.

Zafar Iqbal
Area Manager
M/s K.S. Mas (Pvt) Ltd.,
Holy Family Hospital Road,
Rawalpindi-Pakistan.

Zafar Iqbal
Chak No. 116 J.B.,
District Faisalabad.

Cont'd P/23

STUDENT MEMBERS

Department Of Food Technology, University Of Agriculture, Faisalabad.

Abdul Shakoor
Abid Hussain
Ahmad Jawad
Ali Ismail Abdikarim
Arshad Javed
Asif Kamal Gulzar
Aurangzeb Badar
Faisal Kamran Faisal
Haroon Rashid
Hassan Akhtar Qureshi
Ilyas Ahmad Bhatti
Iftikhar Ahmad
Javed Iqbal
Khalid Ahmed Tarar
M. Izhar-ul-Haq Awan
AlQadree
Malik Muhammad Umer Rauf
Mashhod Ahmad
Mirza Tahir Ahmad
Mohammad Ali Qasami
Mohammad Hassan Qazilbash
Mohammad Imran
Mohammad Tariq Sarwar Awan
Mohammad Wakeel
Mohummad Javid Iqbal
Muhammad Asif
Muhammad Khawar Ishaq
Munawar Ahmad
Munawar Ahmad
Mushtaque Ahmad Malik
Nadeem Shahzad
Nasir Hameed Awan
Nickhat Firdous
Rafiq Ahmad Sultan
Raja Liaqat Hussain
Rashida Sharif
Riffat Mukhtar Raja
Saeed Akhtar
Saima Kaniz Hasan
Shahid Latif
Shahid Mahmood Kiani
Shahzad Shah
Shakeel Ahmed
Syed Ali Raza Kazmi
Tanwir Ahmad Saeed
Tauseef Ahmad Pansota

Barani Agricultural College, Rawalpindi.

Ahmad M. Iqbal
Arif Rashid
Arshad James
Farooq Azam
Saeed Akhtar
Shafqat Abbas
Shahid Sohail Khan
Sher Afzal Khan
Tehseen Mustafa Mirza

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