

PIR MEHR ALI SHAH
ARID AGRICULTURE UNIVERSITY RAWALPINDI



DEPARTMENT OF FOOD TECHNOLOGY
(PhD)

SELF ASSESSMENT REPORT

2016-18
6th Cycle

Program Self Assessment Team

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POSTGRADUATE PROGRAM
Ph. D. (Agri.) Food Technology

CONTENTS

	Introduction
Criterion 1	Mission of the Program, its' Objectives and Outcomes
Criterion 2	Curriculum Design and Organization
Criterion 3	Laboratories and Computer Facilities
Criterion 4	Students Support and Guidance
Criterion 5	Process Control
Criterion 6	Faculty
Criterion 7	Institutional Facilities
Criterion 8	Institutional Support

TABLES

Table-1: Program Objectives Assessment
Table-2: Standard 1-2: Program Outcomes
Table-3: Objective vs outcomes
Table-4 Course allocation to the teachers
Table-5: Quantitative assessment of the department
Table-6: Scheme of studies for Ph.D Agri. (Food Technology)
Table-7: Courses outcome
Table.8. Detail of courses showing theoretical backgrounds, problem analysis and solution design
Table-9: Faculty distribution by program area in Food Technology
Table-10: Passed out student in different programs from 20016-2018

INTRODUCTION

Since its inception in 1980, the Department of Food Technology, has been contributing in dissemination of knowledge and skills related to food technology, initially at undergraduate, graduate and with profound efforts and support of the teaching as well as administrative staff, the higher degree programme of Ph.D. in Food Technology was initiated in 2001.

The same intense efforts of all stakeholders, soon resulted in up-gradation of the department into Institute of Food and Nutritional Sciences (IFNS), PMAS-AAUR. The number figure of students engaged in Ph.D. program is now more than double of the one in 2012-14 that was 05. The dissemination of knowledge and skills, related to food along the entire supply chain, involving handling, processing, transportation, preservation, value addition keeping in view the chemical, biochemical, microbiological and many other important features is the core objective of the department.

Pakistan being an agro-based economy, is now moving towards establishing more and more agro-based industries. The Food industry growth has now increased the demand of graduates and post-graduate workforce specialized in the core field of food technology. In this way the department of food technology is well serving the purpose for meeting the demands of the industry, especially in the adjoining industrial estates of Hattar, (KPK) and that of twin cities of Rawalpindi and Islamabad.

A welcoming gesture in this regard is the direct collaboration among department and industry, which not only makes the young researchers well verse with the practical research on mega scale but also paves the way for solution of problems, being faced by the industry. In this regard department has arranged number of conferences and seminars with the help of its industrial partners which yielded fruitful results for all stakeholders.

Salient contributions, being offered by the department include; Short training courses about value addition of food commodities, preservation of fruit and vegetables, development of innovative bakery items; provision of advisory services to the fruits and vegetables growers on post-harvest technology; provision of consultations to different food industries on demand; engaging students on internship in various food factories and research organizations.

Self-Assessment Report (SAR), of the Ph.d Agri. (Food technology Program), mainly comprises of program's mission and objectives that are contained in the first section. Curriculum development is depicted in 2nd section and laboratories and other facilities present in the department are highlighted in the third section. Aspects about student's reports, department staff, and support being provided by different departments of the university and many other important facts are highlighted in remaining sections.

SECTION 1:

Elements of Self Assessment Process:

This Self Assessment has been prepared on the basis of following criteria as described in Self Assessment Manual.

Criterion-1: Mission of the Program, its Objectives and Outcomes

Introduction

In strict terms, food technology is basically the application of knowledge of food science to 'add value' to food commodities such as dairy products, meat, fruits, vegetables, grains etc. The food technologists maneuver knowledge of raw foods their handling, processing, packaging etc. with the final aim of provision of safe, and value added products to the consumer.

Mission Statement

The overall mission of the Ph.d program is contribution in poverty alleviation through inspiration for creation of prospects for generating and increasing income within the micro-, small-, medium- and large-scale food industries. Furthermore the Department will also contribute to food safety, security, provision of cost-effective environment, innovation of friendly processing technologies through better trained manpower which will contribute in increasing foreign exchange earnings. The goal of the department is to prepare our students for creative, challenging, diverse and rewarding careers in the food industry thus letting the skilled next generation contribute at their full potential.

Standards:

Standard 1-1: Documented quantifiable objectives

Strategic objectives of the department are as follows:

1. Improvement of department for Ph.D education
2. To teach practical and useful information to the Ph.D students
3. Assimilation of multi- dimensions of Food Technology
4. Anticipation of new teaching and researchable areas

MAIN FEATURES OF STRATEGIC PLAN PERSUING MISSION AND OBJECTIVES

1. Improvement & strengthening of Food Technology discipline at PMAS-AAUR
2. Provision of elementary and applied knowledge to the Post-graduate students
3. Supervision to students in research
4. Eagerness of new teaching/researchable areas

OUTCOMES

1. Development of skilled human resource in the area of food science and technology
2. Expansion of indigenous technologies through research
3. Provision of services to the food industry to solve their problems
4. Delivery of service to the local community for value added food products

PROGRAM OBJECTIVES ASSESSMENT

S. #	Objective	How Measured	When Measured	Improvement Identified	Improvement made
1	Improvement and escalation of Food Technology Department for Ph.D education	After gaging the accessibility of latest research services and practical appliance of new technology in Food aspects	As requisite requirement. It is an incessant practice	Training and research smartness requires to be superior	The stimulation of more comprehensible teaching and research methods has been done
2	Communication of solid and useful	By semester mode examinations,	During their mid and final exams,	A few innovative courses and research facilities	Curriculum revised for Ph.D program

	information to the Ph.D students	seminars and research presentation examinations	seminars and research presentation	are needed to be included in the Ph.D curricula	following HEC criteria
3	Integration of multi-dimensions of the field of food technology	Through investigating the students in incorporation of the effects in coursework and comprehensive exams	During semester exams and in comprehensive exams after completion of research	The induction of multidimensional courses is needed to be integrated in the Ph.D Course work	Inception and delivery of new subjects covering the entire boundary of Food Technology has been done
4	Keenness of new teaching and researchable areas	Comparison with the new recent progress in the pertinent areas of Food Technology	It is constant doings	Innovative courses and research problems are needed to be included in curriculum and research priority areas	Endorsement of new curricula and research areas has been accorded by Faculty Academic Council

STANDARD 1-2: ASSOCIATION OF PROGRAM OBJECTIVES VS OUTCOMES

1. OBJECTIVES VS. OUTCOMES

	1	2	3	4
Development OF Human Resource in the field	XXX	XXX	XX	X
Meeting the demands of food industry and research organization through skills development and innovative technologies	XX	XX	X	X
Consciousness about food industry environment and professional morals	XXX	XX	X	X
Innovative methods for creation of value added products	XXX	XXX	X	X

X = Moderately satisfactory

XX = Satisfactory XXX = Highly satisfactory

Program objectives are fully being reinforced as depicted from the conditions and outcomes mentioned above and outcomes are based on actual details obtained from department documents.

Program objectives:

1. Provision of in-depth knowledge in food science and technology
2. Skills improvement to fulfill the need of food industry and research organization
3. Building up consciousness about existing food industry environment and professional ethics

Program outcomes:

1. Student will acquire ability to apply knowledge of food science and technology to solve industrial problems
2. Student will acquire ability to apply quality control measures in food industry
3. Student will be able to apply their knowledge to control production process in food industry
4. Student will be able to converse effectively in written, oral by using quality visual aids

Student shall have an understanding of professional and ethical responsibilities.

Standard 1-3: The results of Program's assessment and the extent to which they are used to improve the program must be documented.

Strength of the Department

An important asset of the department is the availability of all expertise viz. Nutrition, Microbiology, Nutraceutical and Quality Assurance, Cereal Technology, Post Harvest Technology etc. The experts are well versed with their respective subjects, having vast knowledge of local agriculture production systems and disease problems and most of the faculty members have advanced degrees. Their work has been published in national and international Journals. They have also implemented national research projects and are highly conscious of the problems to be taken by the postgraduate students.

Faintness Identified in the Program

Non-availability of important equipment as ELISA Reader, plate washer, homogenizers etc is handicapping the full potential of teaching and research. Lack of short term foreign training to young faculty members is also worsening the situation.

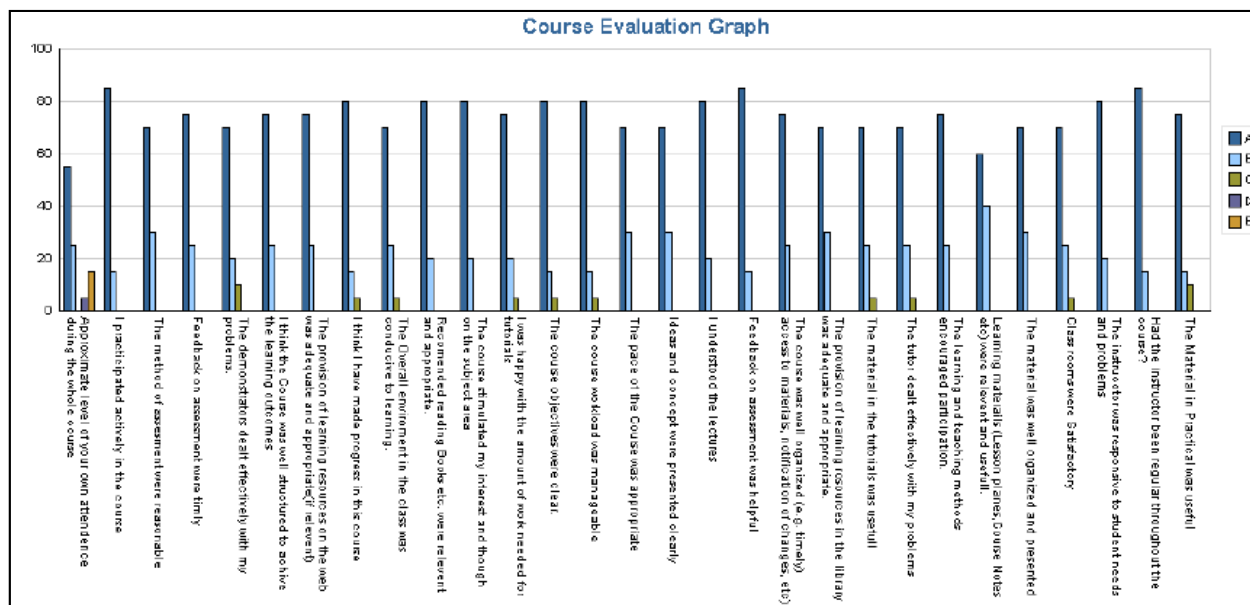
Advanced Post-graduate laboratories, lecture rooms, common rooms, and library aids are also limiting factors. The students' work indicates that there is some opportunity for improving communication skills and the focusing on the practical aspects.

Standard 1-4: The department must assess its overall performance periodically using quantifiable measures.

Performance of the faculty members pertaining to research activities indicates that there are more than 200 research papers and many other publications and many important projects in the credit of faculty members of the department.

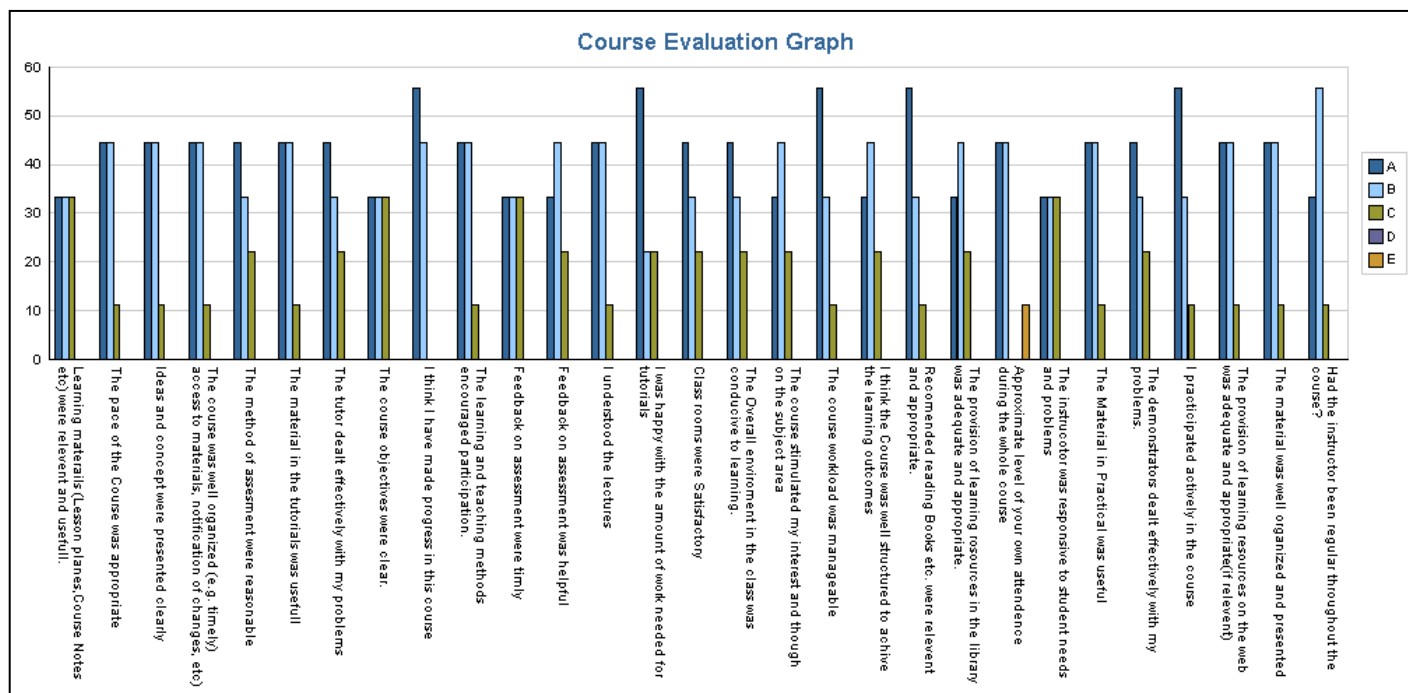
Course Evaluation

FT 708 Food Carbohydrates Chemistry and Technology Prof. Dr. Asif Ahmad



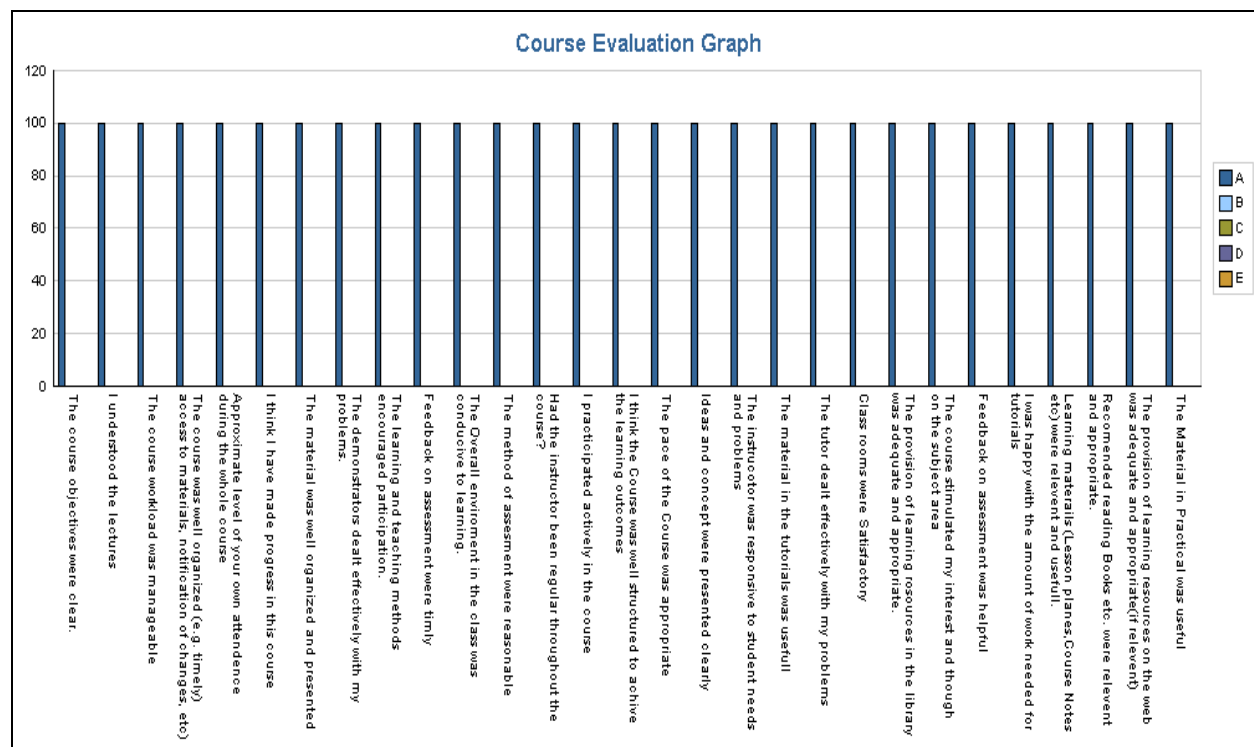
The course was well compiled that was evident from the fact that, overall eighty percent students strongly believed that they made progress in the course, suggested books were relevant, course stimulated the interest on subject area and course was meaningful. The course, also alluded towards different aspects regarding the overall chemistry of different constituents of related foods.

FT 725 Advances in Food Microbiology Dr. Asma Sohail

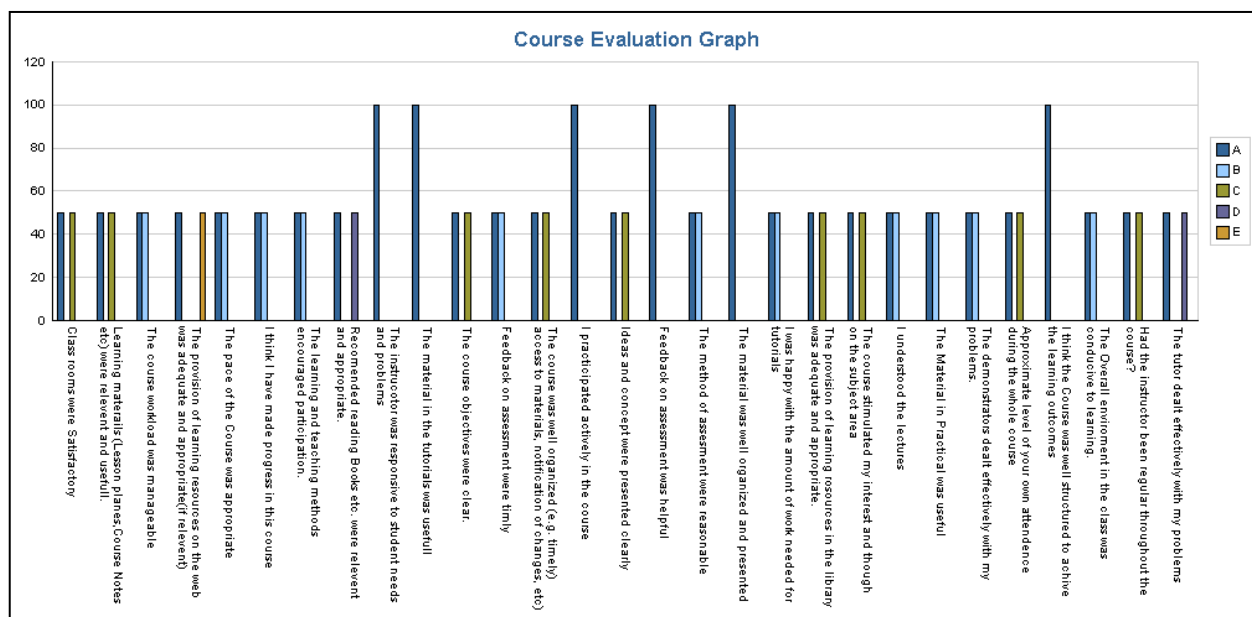


The course was improved as compared to previous trends because of inclusion of new advanced techniques that were actually the core demand of the course, which is even evident from the title of the course. It is worth mentioning that fifty eight percent students strongly agree that they have made improvement in course and the course workload was manageable. 45 percent students agree that the course objectives were clear and response on assessment were helpful. 33 percent students are indistinct about the instructor was responsive for students needs and problems. The practical aspects of the subject were also affectively covered that helped in better understanding by the students.

FT 722 Recent Advances in Food Sciences and Technology Dr. Asma Sohail

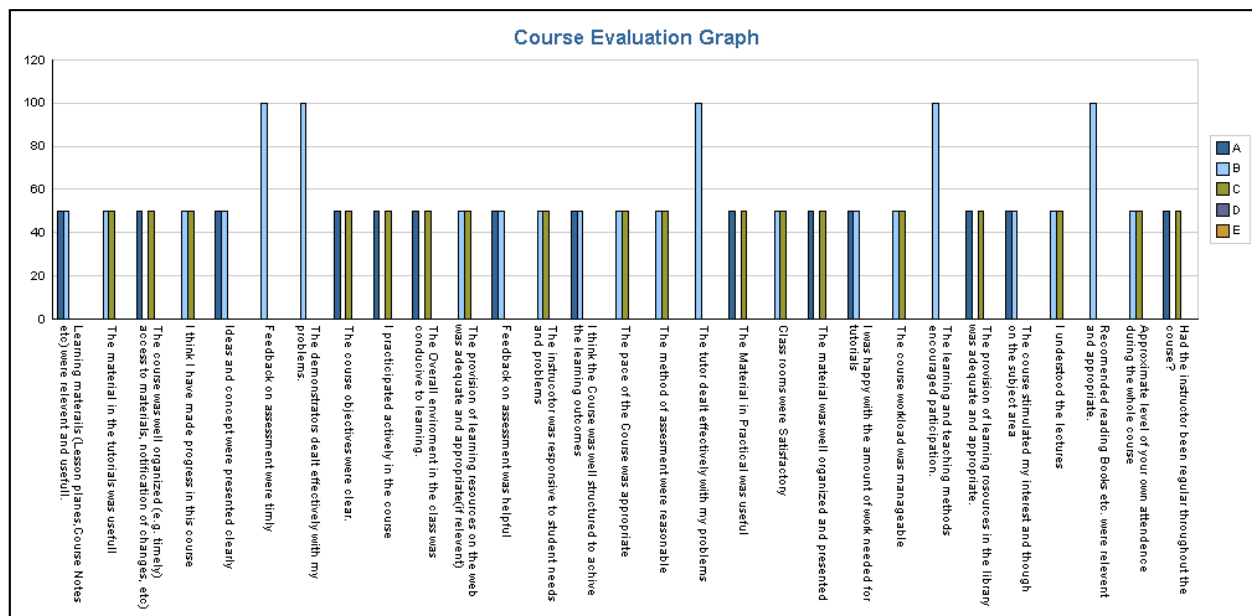


The course had to be built upon the recent advances and trends in food science and technology, and fortunately, the same aspect was kept intact. A positive gesture, being reflected by the data, shows that almost hundred percent students strongly agree that they understood the lectures and response on assessment were helpful. Course helped the students understanding the recent trends in the science of food technology and their possible application in our indigenous conditions.



The course of Food microbiology, an important basic component of food technology, was well compiled to almost cover each core and basic concept of the field. It is admirable that hundred percent students strongly agreed that the teacher was well responsive to students needs and problems and the course objective were clear. Also hundred percent students were of the view that course was well structured and material was organized. About fifty percent were contented with the method of assessment and the material provided in the tutorial, provision of learning, organization and presentation of course material. The overall aspects of the subject were affectively covered.

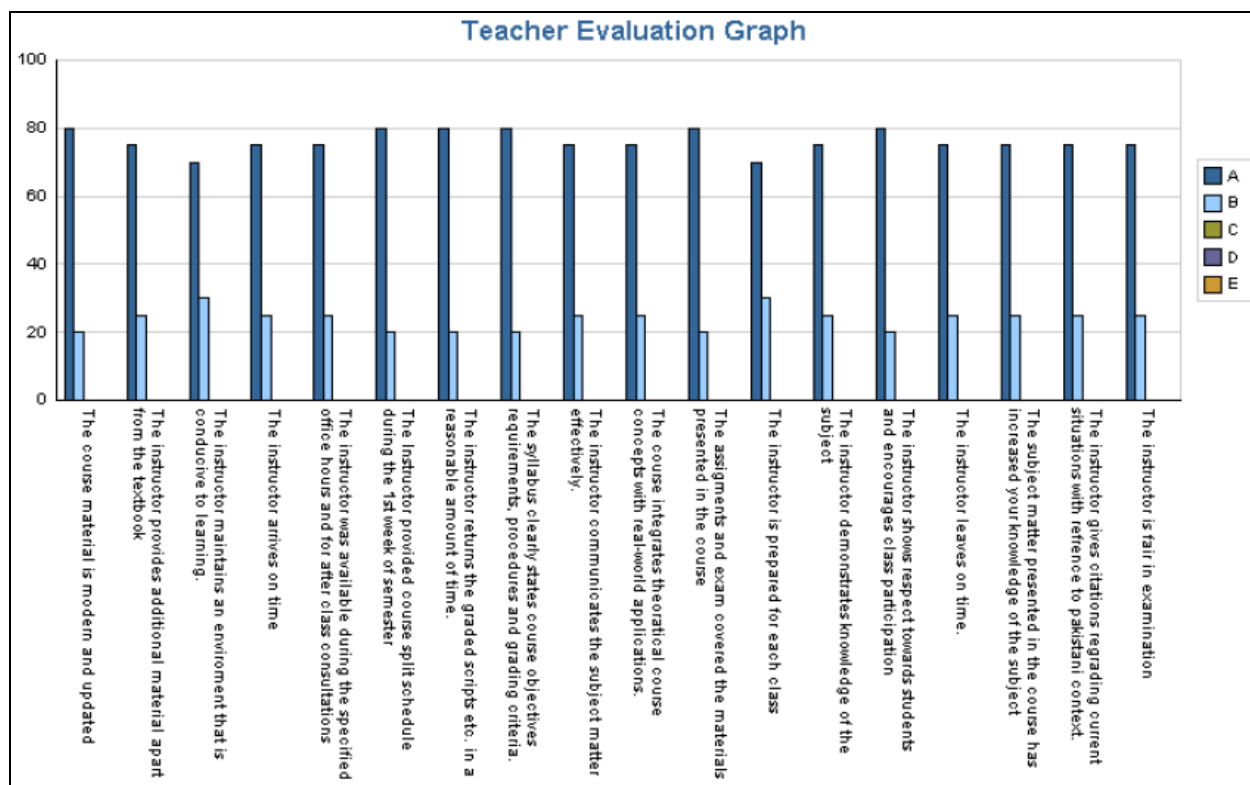
FT 705 Quality Assurance Management Dr. Anwaar Ahmad



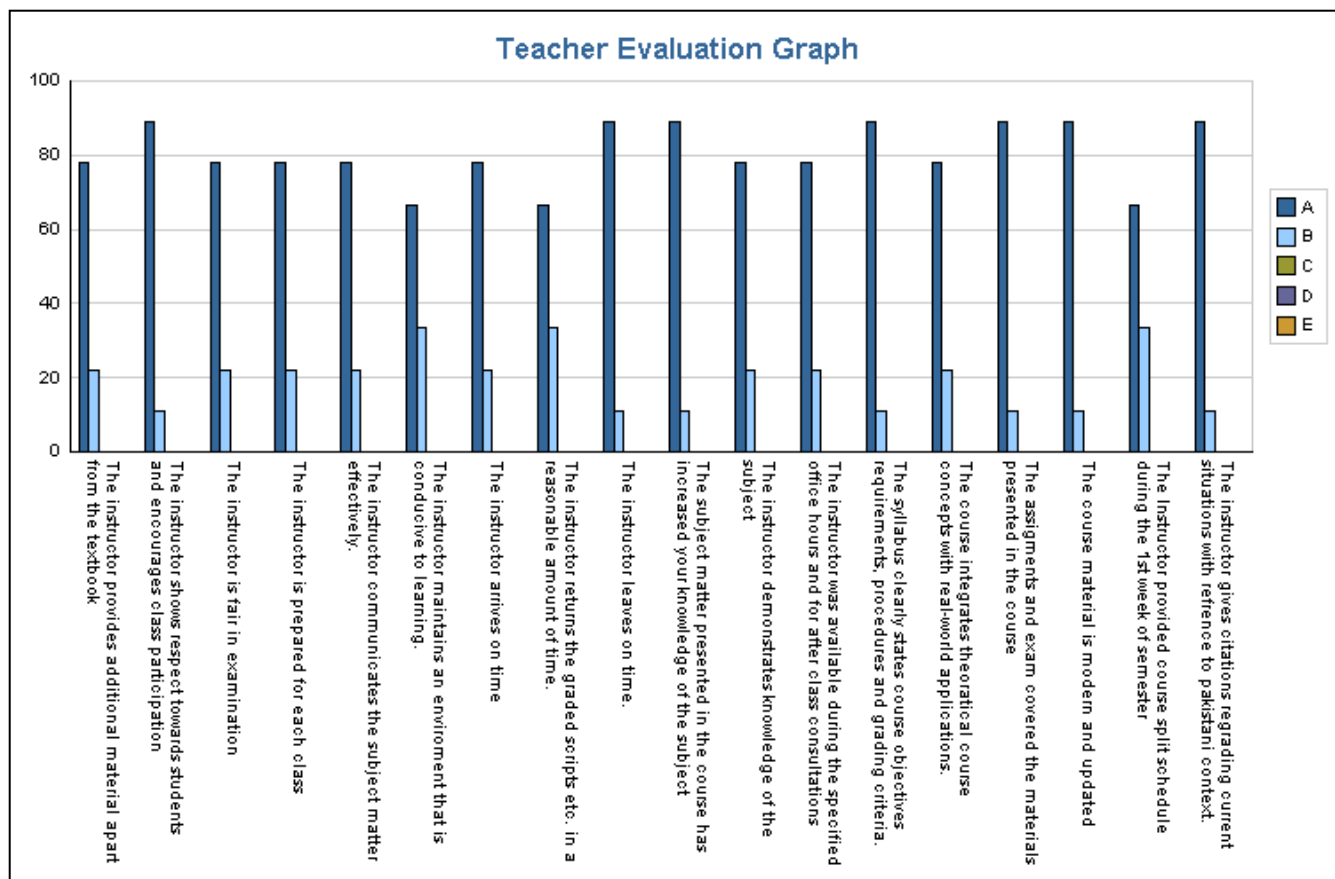
One of the most important, aspect regarding the present operational demands of quality management in any food industry was highlighted affectively in the course. It is worth mentioning that almost Forty five percent students were agreed that course objectives were clear and course was well structured to get better learning outcomes. Additionally, hundred percent students were of the view that presenter dealt effectively with my problems. More than forty percent students were strongly agreed course work load was manageable.

Teachers Evaluation

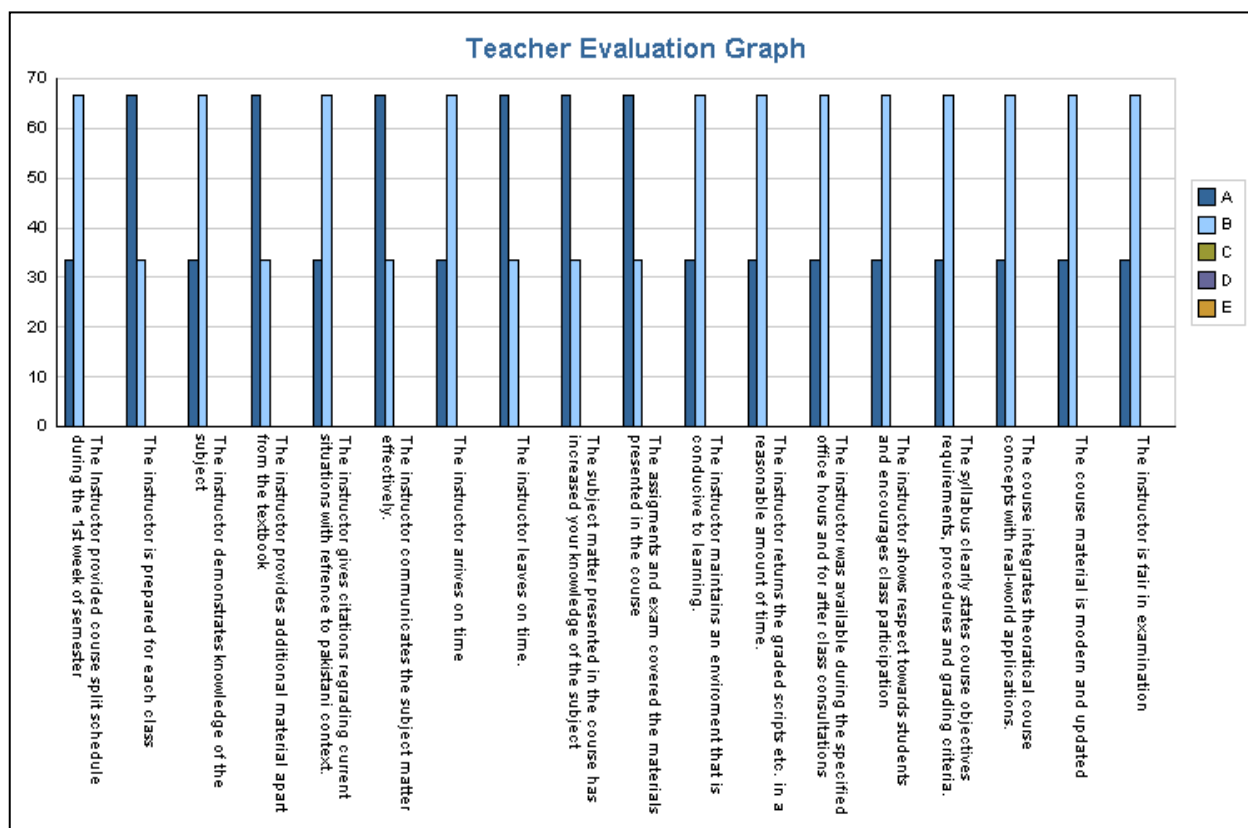
FT 708 Food Carbohydrates Chemistry and Technology Prof. Dr. Asif Ahmad



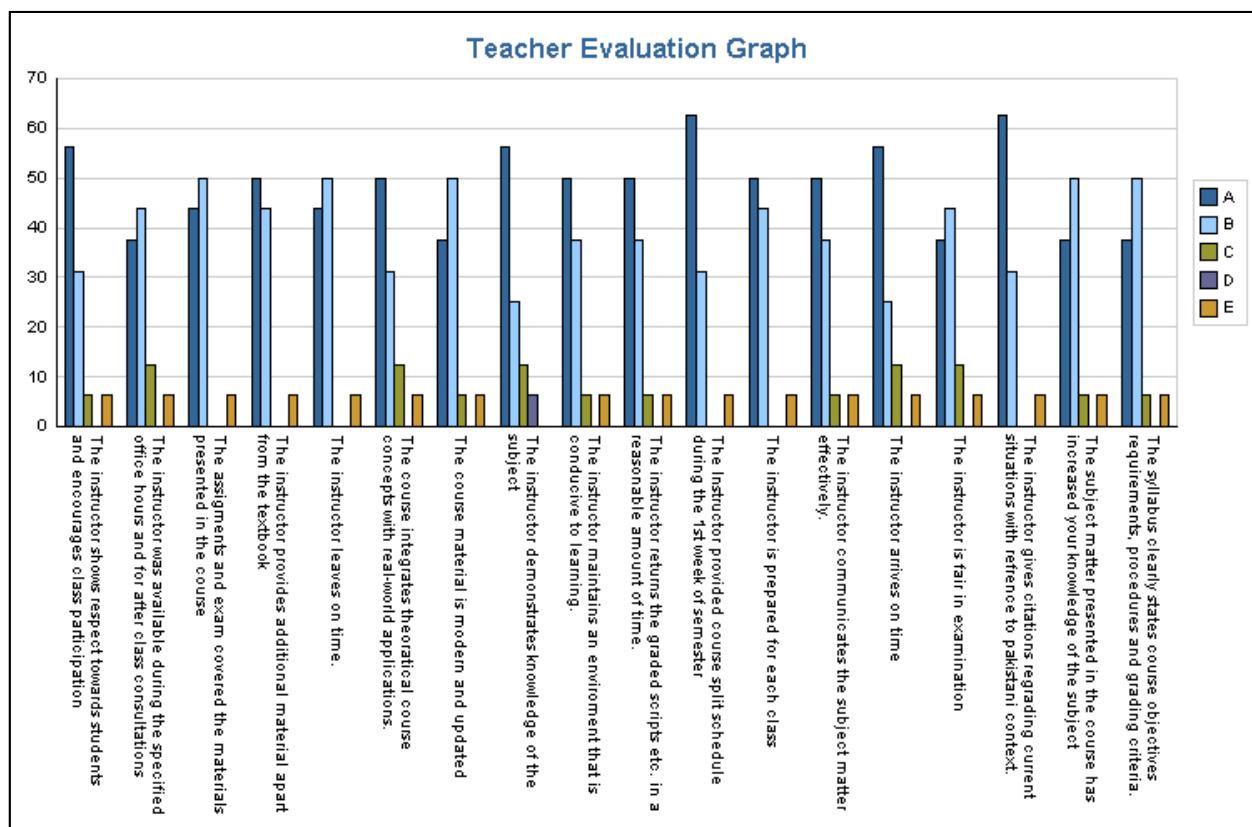
The nature and well outlined course contents helped in better understanding for the students and was further improved with the profound efforts of teacher. It is worth mentioning that more than 75 percent students strongly agreed that instructor provide additional material apart from textbook and instructor communicate the subject effectively. Almost eighty percent students strongly agreed that course material was modern and updated. Instructor provided course fragmented schedule during first week, instructor returns graded scripts timely, syllabus clearly states subjected matter, assignments and exams covered the material presented in the course and instructor showed respect towards the students.



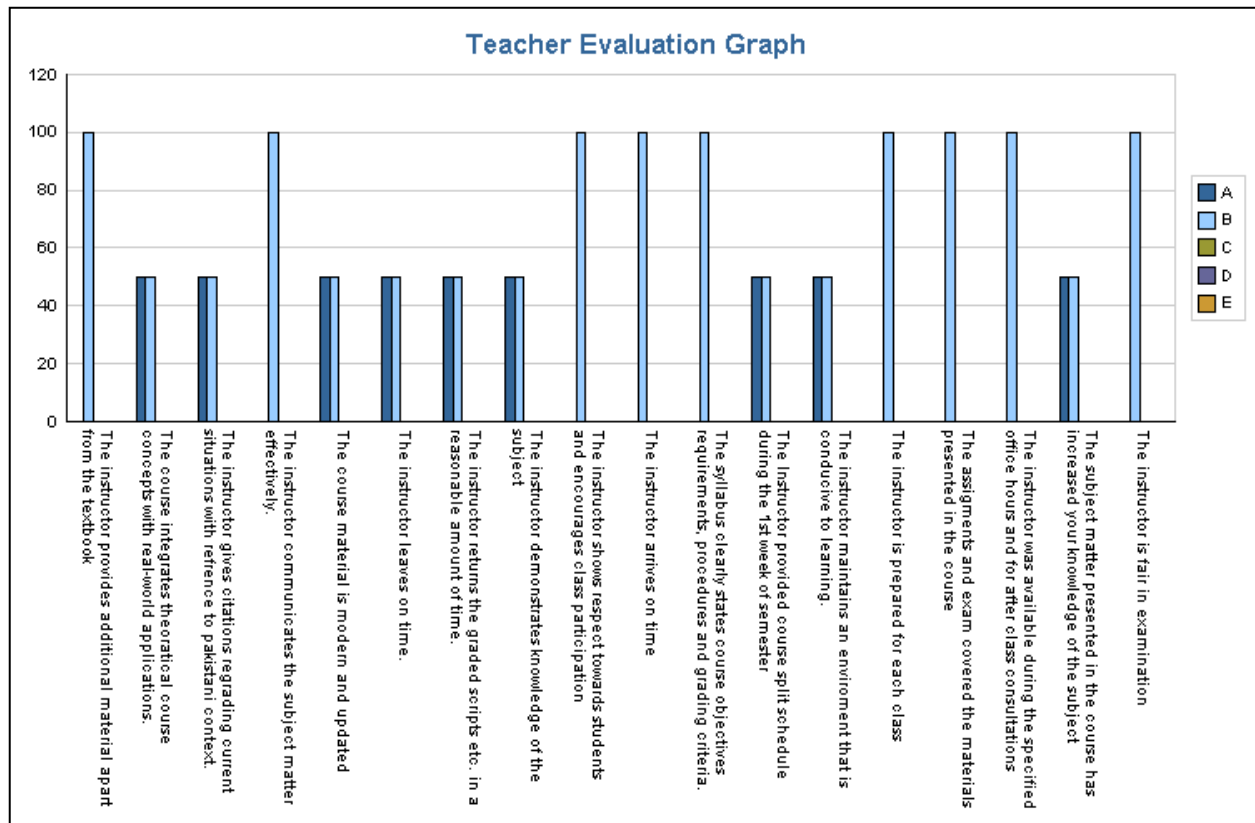
The course content were well outlined and prepared by the teacher. The true background of the same field keeping in view the specialization profile of the teacher, helped him in better communication. Students became well aware of the core concept of the subject. It is worth mentioning that about ninety percent students strongly agreed that the instructor leaves on time and the course material was modern and updated. The teacher communicated affectively to address the concerns of students.



Owing to inclusion of modern trends in food science in technology in the course content, the students zeal was kept alive. The credit towards the teacher was evident from the fact that more than thirty percent of the students agree that the instructor provided additional material apart from the tutorials. Additionally considerable no. of students strongly agree that the instructor is prepared for each class and the instructor left on time. Teacher affectively covered all aspect of the course.

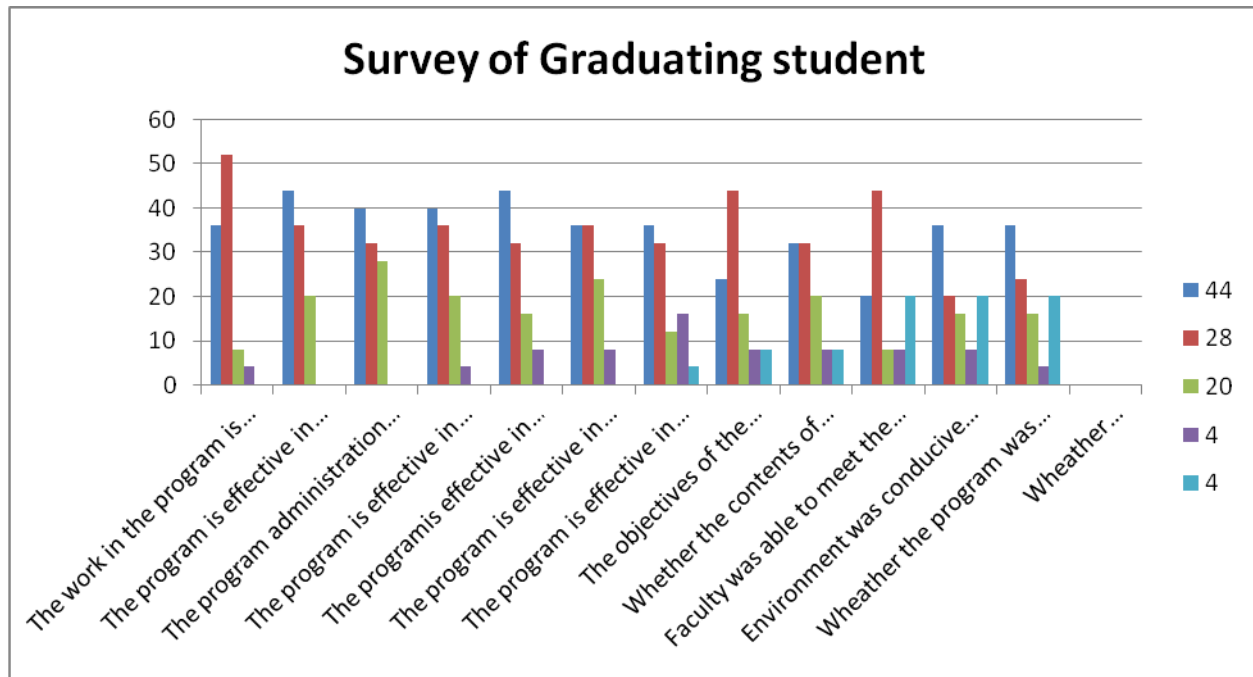


The communication of core basic concepts of the subject by the teacher helped students getting well familiar with the techniques being employed in the field. According to students, instructor maintained favorable environment for learning, returns grade script timely and also leave the class on time. Fifty percent students found that syllabus clearly stated the course objective, instructor prepared for each class and the instructor was also available during the specified office hours. Fifty percent student thought that the instructor communicate the subject matter well and fifty percent were of the view that instructor showed respect toward students and encourage class participation.



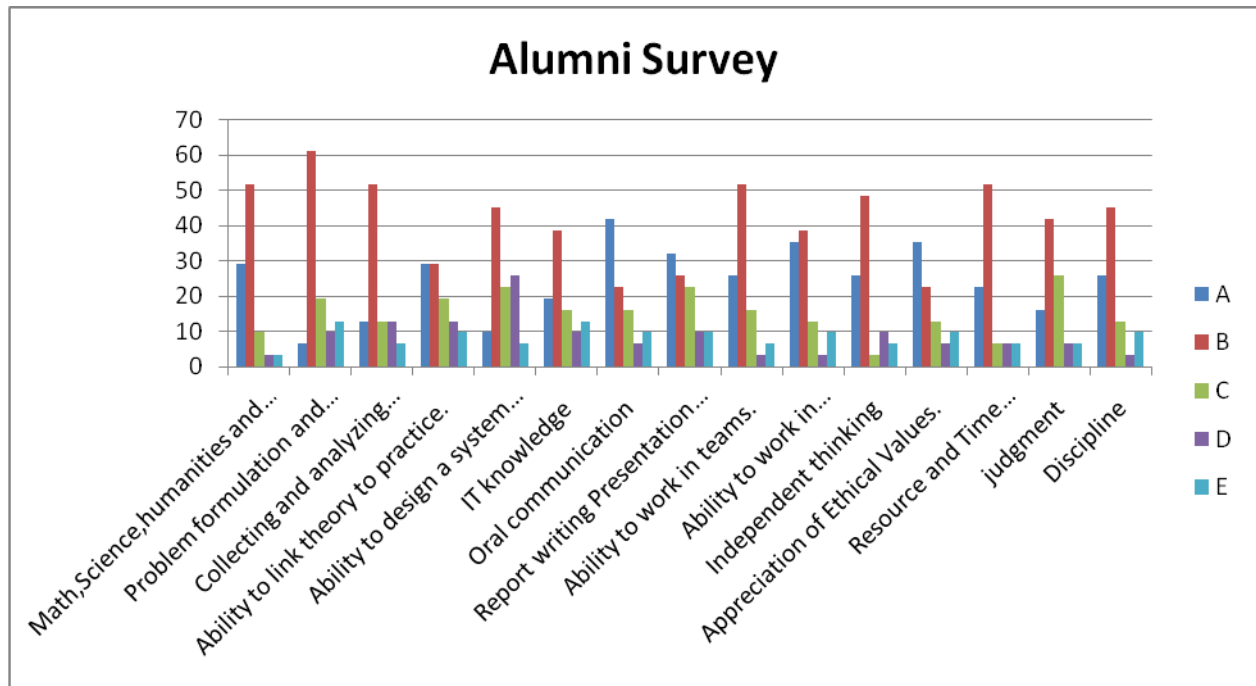
Better communication of advanced quality management practices keeping in view the food industry, by teacher proved helpful in solid understanding by the students. It was assessed that instructor transferred the subject matter effectively, subject matter presented in the course increased their knowledge on subject, instructor was reasonable in examination, instructor provides additional material apart from text book, and course material was modern.

SURVEY OF THE GRADUATING STUDENTS



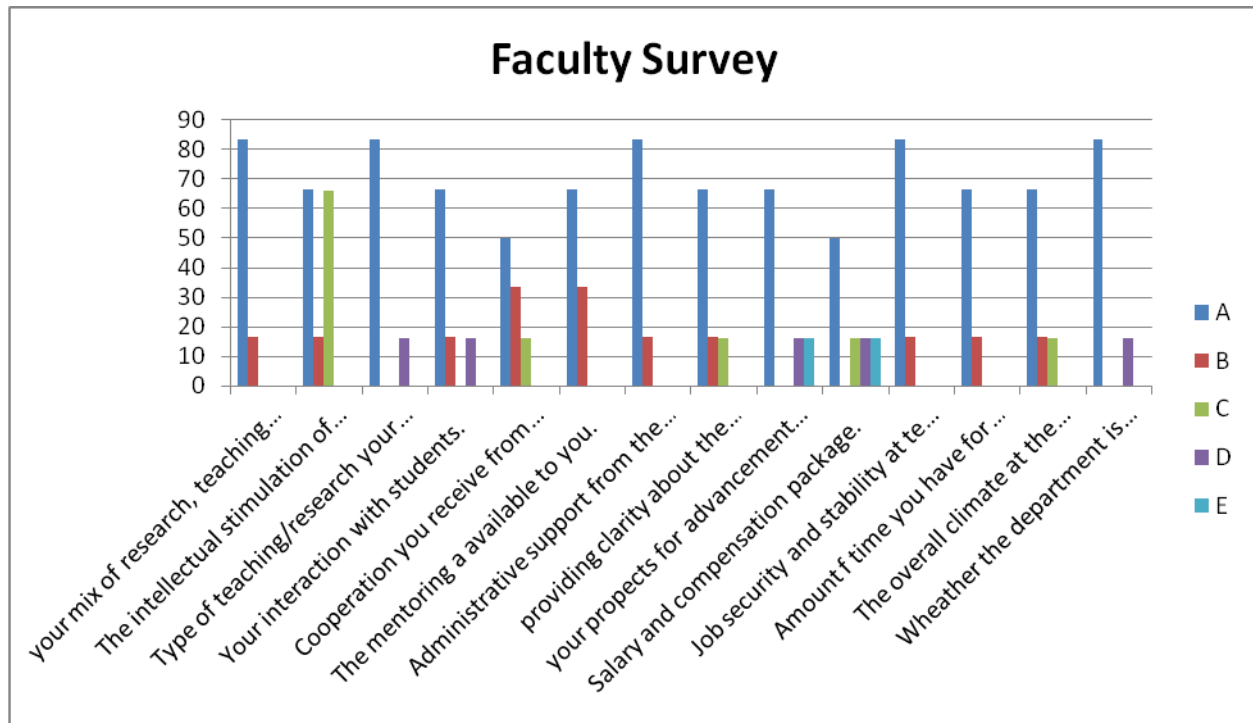
The survey of the graduating students proves a well assessment tool about overall progress of the program. Around forty five students were included in the survey. Most of the students were very satisfied with program management, development of analytical and problem solving skills, the program is effective in developing independent thinking, written communication skills and planning abilities, the contents of curriculum are advanced and meet program objectives, faculty was able to meet the program objectives and the environment was conducive for learning. Roughly, fifty nine percent of the students were very satisfied (VS), twenty eight percent satisfied, eighteen percent uncertain, two percent dissatisfied and three percent very dissatisfied for the work. Moreover, the overall portrayed picture of the progress in the subject was satisfactory.

ALUMNI SURVEY



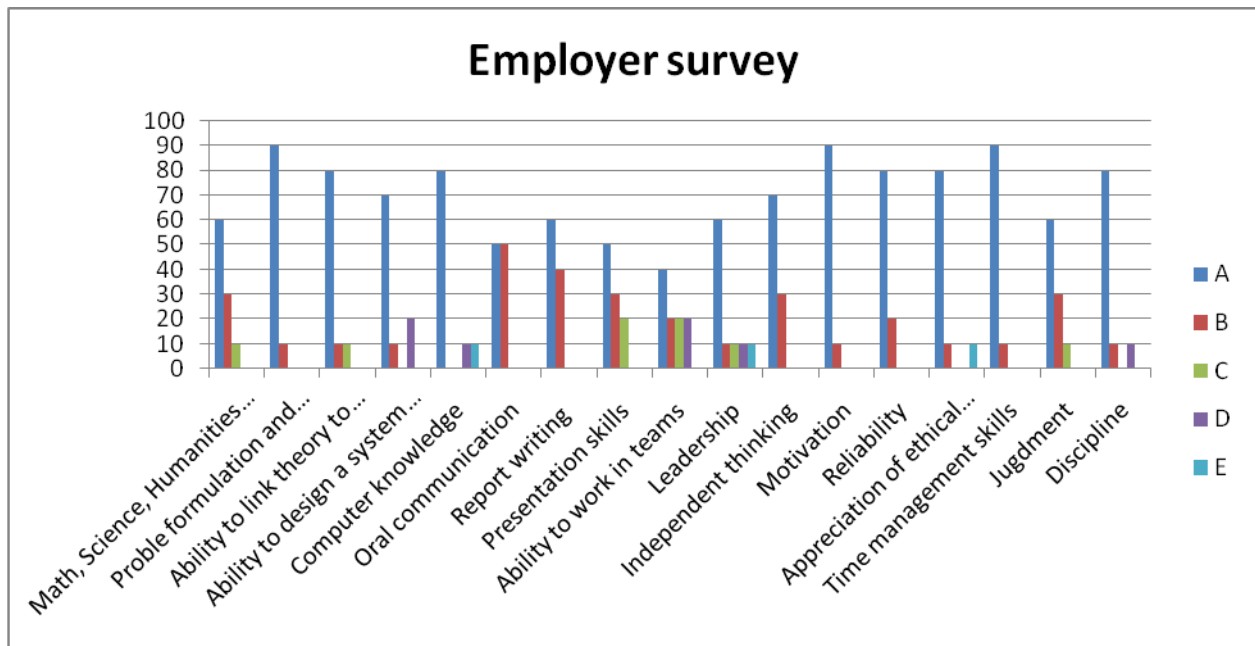
Alumni survey, helped in better comparison of the overall improvement of the program. The survey reflects alumni input on the quality of education and research they received and many other factors. A total of fifty seven alumni were surveyed. The data showed that most of the Alumni reported excellent concerning department trained them excellently about the interpersonal skills such as team work, training of oral communication, IT knowledge, report writing and management skills, department has excellent infrastructure and repute, working in difficult conditions and independent philosophy. Keeping in view the past survey, the progress of the program was acceptable.

FACULTY SURVEY



For affective and successful delivery of the program, satisfaction of the faculty members regarding the working conditions is pretty necessary. The workload over the faculty members, remained a bit on high side, however, the members managed well to meet the goals. Need of proper training, workshops etc. for new faculty members was seriously felt. The faculty survey, showed that thirty percent of faculty members were very satisfied, twenty three percent satisfied, twenty three percent uncertain, fifteen percent dissatisfied and eighteen percent very dissatisfied are satisfied with their job clarity about promotion process. However, the overall assessment, does allude towards the affective response with little efforts from the administration side.

EMPLOYER SURVEY



The employer survey, in any organization bears an important assessment tool for future success by onward affective management in the next period. During the survey, eleven employers provided the data. The generated data showed the report of the employers about the Math, Science, Humanities and professional discipline was as forty nine percent excellent, thirty five percent very good, three percent good, two percent fair and one percent poor. All the employers significantly favored the excellent performance of the candidates as regards different aspects of the professional life like power of problem formulation and solving skills, and have great ability of oral communication and are reliable and morally sound. Employers showed a little apprehension about computer skills of the students. The survey, overall showed a positive mark, for improvement in the approaching period by reasonable efforts.

Performa 4

RESEARCH STUDENT PROGRESS REVIEW FORM

The students affectively carried out their research in their field. These students completed their course work in the fourth semester and total credit hours were 35.

Q. No. 6: Cumulative Grade Point Average Secured:

It is welcoming that CGPA of all students was well above than three.

Q. No. 8: Do you have any comments on the level of supervision received?

All students were highly satisfied by the level of supervision received by their supervisory committee.

Q. No. 9: What do you plan to achieve over the next 6 months?

Plan of the most of the studies being carried out for next 6 months remain the data analysis and writing up of thesis. The same aspect is well planned for affective achievement.

Q. No. 11: Do you have easy access to sophisticated scientific equipments?

All students have an easy access to all the general equipment available in the department.

Q. No. 12: Do you have sufficient research material / commodities available?

Students have sufficient research material and commodities available in the Department. However, further efforts are being done to improve mark.

SECTION 2:

CRITERION 2: CURRICULUM DESIGN AND ORGANIZATION

Ph.D.

The spell of course of the degree of Doctor of Philosophy in full residence is not less than six semesters and not more than ten semesters.

Pre-requisites

A candidate seeking admission to the course must have passed the Master Degree with CGPA of 3.00. Merit for post graduate program is determined as per the following formula

Matric	10 percent
Intermediate	15 percent
B.Sc. (Hons)	35 percent
Entry test	40 percent

Degree requirements

The program contents meet the program objectives as highlighted and provided by the Higher Education Commission. Minimum 18 credits of course work is compulsory; out of which 9 credits are of core/compulsory courses. Course work is followed by synopsis defense seminar, comprehensive examination and finally the submission of thesis. The thesis is to be approved by the University and also examined by two foreign internationally recognized scientists from the University of technically advanced countries. However, with the passage of time and efforts of HEC, the requirements are being further improved.

POST GRADUATE COURSES Ph. D. AGRI. (Food Technology)

Course No.	Course Title	Credit Hours
FT-705	Quality Assurance Management	3(3-0)
FT-710	Food Biotechnology	3(2-2)
FT-708	Food Carbohydrates Chemistry and Technology	3(3-0)
FT-722	Recent Advances in Food Sciences and Technology	3(3-0)
FT-725	Advanced Food Microbiology	3(2-2)
FT-799 Ph.D	Research and Thesis	50(0-100)

Detailed course contents of Post-graduate schemes of studies are given in annexure-I.

Standard 2.1: Assessment of the Food Technology Curriculum

The assessment of curriculum given in the following table and the courses are cross tabulated according to the program outcomes.

COURSES VS OUTCOME

Courses	Out comes			
	1	2	3	4
FT-708, FT-710	XX	XXX	X	XXX
FT, 727, FT-702	XXX	XXX	XXX	X

X = Moderately satisfactory
 XX = Satisfactory
 XXX = Highly satisfactory

- The curriculum fits very well and satisfies the core requirements for the program, as specified the respective accreditation body.
- The curriculum satisfied the general arts and professional and other discipline required for the program according to demands and requirements set by the Pakistan Higher Education Commission.

Standard 2-2: Theoretical backgrounds, problem analysis, solution design given as under.

Detail of courses showing theoretical backgrounds, problem analysis and solution design

Elements	Courses	Title	
Theoretical Background		FT-705 Quality Assurance Management	
		FT-710 Food Biotechnology	
		FT-708 Food Carbohydrates Chemistry and Technology	
		FT-722 Recent Advances in Food Sciences and Technology	
		FT-725 Advanced Food Microbiology	
		FT-799 Ph.D Research and Thesis	
problem analysis		FT-705 Quality Assurance Management	
		FT-710 Food Biotechnology	
		FT-708 Food Carbohydrates Chemistry and Technology	
		FT-722 Recent Advances in Food Sciences and Technology	
		FT-725 Advanced Food Microbiology	
		FT-799 Ph.D Research and Thesis	
solution design		FT-705 Quality Assurance Management	3(3-0)
		FT-710 Food Biotechnology	3(2-2)
		FT-708 Food Carbohydrates Chemistry and Technology	3(3-0)
		FT-722 Recent Advances in Food Sciences and Technology	3(3-0)
		FT-725 Advanced Food Microbiology	3(2-2)
		FT-799 Ph.D Research and Thesis	50(0-100)

Meeting Standard 2-2: Percentage of Elements in Courses

Elements	Courses
Theoretical backgrounds	55 percent
Problem analysis	25 percent
Solution design	20 percent

Standard 2-6: Information Technology Component of the Curriculum Must Be Integrated Throughout The Program:

Successive improvement in the curriculum is always the need of consistent successful program. After a critical analysis, relevant aspects were integrated into the program and little important aspects related to computer and I.T. courses were included in the program.

Standard 2-7: Enhancing Oral and Written Communication Skills of the students

- For the subject, purpose different assignments are given to students on specific titles (part of the course) which are presented orally and are submitted as written report, to increase their oral and written communication skills. The special courses of seminar in the program helped affectively, in this regard.

Faculty Course Review Report

According to evaluation the faculty is satisfied with curriculum. Questionnaire for evaluation has been filled and analyzed. There was internal evaluation with mid and final term examinations for all courses offered by department. Some of the teachers are keen to revise the courses as they are either outdated or lengthy.

Course Code	Course Title	Credit Hours	Assesment Method/Exam	No. of Students	Comments on Curriculum	Changes for future	Teacher
FT-705	Quality Assurance Management	3(3-0)	Mid Term and Final	<u>35</u>	Informative	No	Dr. Anwaar Ahmed
FT-708	Food Carbohydrates Chemistry and Technology	3(3-0)	Mid Term and Final	<u>21</u>	Lengthy	Yes	Prof. Dr. Asif Ahmad
FT-725	Advanced Food Microbiology	3(2-2)	Mid Term and Final	<u>21</u>	Must be revised	Yes	Dr. Asma Sohail
FT-710	Food Biotechnology	3(2-2)	Mid Term and Final	<u>35</u>	Good	No	Dr. Kashif Sarfraz Abbasi
FT-722	Recent Advances in Food Science and Technology	3(3-0)	Mid Term and Final	<u>35</u>	Excellent	No	Dr. Asma Sohail

SURVEY OF DEPARTMENT OFFERING Ph.D. PROGRAMS

Department of food technology has started its Ph.D. program since 2001 and 08 students have completed Ph.D. from the department while 12 students are currently enrolled in department in Ph.D. program. Entrance in Ph.D. requires M.Phil. or M.Sc. with thesis. Ph.D. is research based and maximum time duration is 5 years. A research paper is must to publish from Ph.D. thesis in HEC recognize journal. Thesis is sent to two internationally good reputed scientists from academically advanced countries for evaluation. There are 5 permanent faculty members holding Ph.D. degree in the department and are HEC approved supervisors.

1	General Information:	
1.1	Name of Department	Food Technology
1.2	Name of Faculty	FCFS
1.3	Date of initiation of Ph.D. program	2001
1.4	Total number of academic journals subscribed in area relevant to Ph.D. program.	NIL
1.5	Number of Computers available per Ph.D. student	Laptops are available under Prime Minister Scheme
1.6	Total Internet Bandwidth available to all the students in the Department.	NIL
2	Faculty Resources:	
2.1	Number of faculty members holding Ph.D. degree in the department.	05
2.2	Number of HEC approved Ph.D. Advisors in the department.	05
3	Research Output:	
3.1	Total number of articles published last year in International Academic Journals that are authored by faculty members and students in the department.	20
3.3	Total number of ongoing research projects in the department funded by different organizations	02
3.4	Number of post-graduate students in the department holding scholarships/fellowships.	06
3.6	Number of active international linkages involving exchange of researchers/students/faculty etc. (Attach Details).	0
	Student Information:	
4.1	Number of Ph.D. degrees conferred to date to students from the Department during the past three academic years.	08
4.2	Number of Ph.D. students currently enrolled in the department.	11
5	Program Information	

5.1	Entrance requirements into Ph.D. Program (M.Sc. / M.Phil.) Indicate subjects or M.Sc. / M.Phil.	M.Sc. with thesis or M.Phil.
5.2	Is your Ph.D. program based on research only? (Y/N)	No on Both course work and research
5.3	Maximum number of years in which a Ph.D. degree has to be completed after initial date of enrollment in Ph.D. program.	5 years
5.7	Do your students have to take/write:	
	Ph.D. Qualifying examination (Y/N)	Yes
	Comprehensive examination (Y/N)	Yes
	Research paper in HEC approved Journal	Two
	Any other examination (Y/N)	No
5.8	Total number of International examiners to which the Ph.D. dissertation is sent.	2
5.9	How is the selection of an examiner from technologically advanced countries carried out?	Subject relevance/recent status of research
5.10	Is there a minimum residency requirement (on campus) for award of Ph.D. degree?	3 years
6	Additional Information	
6.1	Any other information that you would like to provide.	Nil

SECTION 3:

CRITERION 3: LABORATORIES AND COMPUTER FACILITIES

The laboratory facilities are serious concern for the department. There are only two laboratories in the department. The facilities and shortcomings of these laboratories are listed as under.

- Title of the Laboratory: Food Technology Laboratories for the Under-graduate and Post-graduate students.
- Location and Area: Faculty of Agriculture and Food Sciences, D- Block, 2nd Floor, Main Campus
- Objectives: Laboratories are used for: Practical exercise and demonstrations to graduate students in their introductory and major courses. Research work for the graduate and post-graduate students. For implementing the projects funded by the University, H.E.C, and P.S.F,
- Shortcoming: Laboratories are not spacious and inadequate. The standard requirements in view of equipment, available resources and expansion program. Latest apparatus for cereal technology, nutrition and post harvest technology is missing
- Safety Regulations: Safety measures are not available against fire (Extinguishers), minor hazards and accidents, injuries (First Aid Kit). However, the University maintains a Medical Dispensary for such incidents.

Standard 3-1: Laboratory Manuals:

Laboratory manuals do play key part, for proper performance of the research work. Laboratory manuals for each subject (cereal technology, microbiology, biotechnology, post harvest technology, food safety, dairy technology are not available. The department library has not all the relevant books. However, teachers have their own books to prepare the lectures. Some manuals are being prepared by the academic staff.

Standard 3-2: Support/Laboratory Personal For Maintenance of Laboratory

Like earlier, only three lab. Attendant are available to maintain laboratory, equipment, glassware, chemicals, material etc. One laboratory assistant is available who assists the students in practicals. The laboratory attendants do not have the relevant knowledge.

INSTITUTIONAL FACILITIES:

For affective delivery of the knowledge to learners, the proper institutional facilities do play a key role for smooth and speedy research. The institution must have the infrastructure to support new trends in learning such as e-learning including digital publications, journals etc.

- The printed material available to students must be of best quality, as to encourage the interest of readers. The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel. In- sufficient library's technical collection of books. Recommended books, relevant journals of the programs are not available to the students.
- The study environment should be soothing. Class rooms must be adequately equipped and offices must be adequate and equipped with modern facilities such as computer, printer, internet and telephone to enable faculty to carry out their responsibilities.

INSTITUTIONAL SUPPORT:

For the past few years, the problems of support are almost the same. Institutional support needs a bit improvement. Certain aspects are important to be considered.

- Classes are taken in the labs as a result of this research activities affected adversely (2016-2018).
- Faculty offices are inadequate and therefore two teachers have one office room.
- There is need of adequate support and financial resources to attract and retain high quality faculty and provide the means for them to maintain competence as teachers and scholars.
- Another important concern is of insufficient secretarial support, technical staff and office equipment.

Standard 3-3: Computing Infrastructure and Facilities

- **Computing facilities support:** Not accessible to all faculty members and the post graduate students.
- **Shortcoming in computing infrastructure:** Good quality and reliable, computers with internet facilities should be available to all faculty members and postgraduate students.
- **Safety Arrangements:** There is lack of proper safety provisions and no security plan is available in case of emergency. The department is located on the 2nd floor; there are no

emergency exits for the labs. No fire extinguishers have been installed in any laboratory. No first aid kits/facilities provided in the laboratories/department.

SECTION 4:

CRITERION 4: STUDENT SUPPORT AND ADVISING

It is important to mention that the institution, arranges support programs for students and provide information regarding admission, scholarship schemes etc. on regular basis. Department in its own capacity arranges orientation and guided tours of the department. Director Students Affairs is also there and arranges various cultural activities and solves the students' problems. However currently there is no Parent/Teacher association.

Standard 4-1: Frequency of Courses

- Courses are delivered as per criteria of HEC.
- Postgraduate level courses are however offered according to the availability of the teacher and number of students.
- Elective courses are offered as per policy of HEC and the University.
- For post graduate programs, a variety of courses is offered according to demand of the profession.

Standard 4-2: Structure of the Courses

To ensure effective interaction between students, faculty and teaching assistants, at the time of course formulation both theoretical and practical aspects are focused. Theoretical problems are explained and assignments are also given to the students whereas practical are carried out in the. The study tours to various research organizations and food industries are also organized to keep them update on the latest developments in the area and to stimulate them for discussion through teacher/student interaction.

- Courses are structured and decided in the board of studies meeting; At the commencement of the semester, faculty members interact frequently among themselves and with students. Students are welcome to ask question in class and even after the class.

Standard 4.3: Guidance to the students

Several footsteps have been taken to provide students guidance such as:

- Personal communication of the teachers with the students is at the top for improvement.

- Regular, monthly meetings are organized by the head of the department for counseling of the students. In addition, students can also contact with the relevant teachers whenever they face any problem.
- Participate of the students in the monthly meeting is necessary.
- Director Student Affairs appointed by the university, helps the students in case of any issue/ problem. Tutorial System in all departments has also been introduced. Two classes on Thursday are reserved for students for extracurricular activities. However, there is no such counseling Cell in the department.
- Student can cooperate with the teachers/scientist in universities or research organization whenever they needed and there is an open option for the students to get the membership in the professional societies like Pakistan Society of Food Scientists and Technologists and other relevant professional societies.
- Understanding the need for exploring job opportunities for the university graduates, Directorate of Placement Bureau has been established.

SECTION 5:

CRITERION 5: PROCESS CONTROL

It includes student admission, students' registration, faculty recruitment activities, which are dealt by various statutory bodies and the university administration.

Standard 5.1: Program Admission Criteria

- The process of admission is well established and followed as per rules and criteria set by HEC. For this purpose an advertisement is published in the National News Papers by the Registrar Office.
- Admission criteria for M.Sc. (Hons) and Ph.D. are same as mentioned in section 2.
- Admission criteria are revised every year before the announcement of admissions.

Standard 5.2: Process of Registration

- The student name, after completion of the admission process, is forwarded to the Registrar Office for proper registration in the specific program and the registration number is issued to the student.
- Registration is done for one time for each degree but evaluation is done through the result of each semester. Only those students who fulfill the criteria of the University, they are promoted to the next semester.
- In general, the students are registered on competition bases keeping in view the academic and research standards.

Standard 5.3: Recruiting Process for Faculty

Recruitment policy followed by the University is recommended by the HEC. Induction of all posts is done as per rule:

- Vacant and newly created positions are advertised in the national newspapers, applications are received by the Registrar office, and call letters are issued to the short-listed candidates on the basis of experience, qualification, publications and other qualities/activities as determined by the University.
- The candidates are interviewed by the University Selection Board and Principal and alternate candidates are selected.

- Selection of candidates is approved by the Syndicate for issuing orders to join within a specified period.
- Induction of new candidates depends upon the number of approved vacancies.
- Standards set by HEC are followed.
- At present, no procedure exists for retaining highly qualified faculty members. However, the revised pay scales structure is quite attractive.
- HEC also supports appointment of highly qualified members as foreign faculty Professors, National Professors and deposes them in concerned departments of the University.

Standard 5.4: Teaching and Delivery of Course Material

- To deliver high quality teaching, department periodically revises the curriculum depending upon requirements, innovations and new technology.
- With the advent of new fields, new courses are introduced, and included in the curriculum.
- Students usually buy cheap Asian editions of technology books. These are also available in the University library, where documentation, copying and internet facilities are available.
- Notes are also prepared by the teachers and given to the students.
- Most of the lectures are supplemented by overheads, slides and pictures.
- All exertions are made that the courses and knowledge imparted meet the objectives and outcome. The progress is regularly reviewed in the staff meetings.

Standard 5.5: Completion of Program Requirements

- The controller of examinations declares the dates of commencement of examination. After each semester, the controller office notifies the results of the students. The evaluation procedure consists of quizzes, mid and final examinations, practicals, assignments and reports, oral and technical presentations. The minimum pass marks for each course is 50 percent for Ph.D. in theory and practical separately.
- In theory, weightage to each component of examination is as prescribed here under:

Mid Examination	30percent
Assignments	10percent

Final Examination 60percent

- Grade points are as follows

Marks obtained	Grade	Grade point	Remarks
80-100 percent	A	4	Excellent
65-79 percent	B	3	Good
50-64 percent	C	2	Satisfactory
40-49 percent	D	1	Pass
Below 40 percent	F	0	Fail

- Gold medals are awarded to the students who secure highest marks. Degrees are awarded to the students on the annual convocation that is held late every year.

SECTION 6

CRITERION 6: FACULTY

Standard 6.1: Full Time Faculty

Faculty Resume

Name	Position	Qualification	Specialization
Dr. Tariq Masud	Professor	Ph. D.	Dairy Technology
Prof. Dr. Asif Ahmad	Associate Professor	Ph. D.	Cereal Technology/ Post Harvest Tech.
Dr. Anwaar Ahmed	Associate Professor	Ph. D.	Nutrition/Cereal Technology
Dr. Asma Sohail	Assistant Professor	Ph. D.	Food Science
Dr. Kashif Sarfraz Abbasi	Lecturer	Ph.D	Food Technology
Ms. Asia Latif	Lecturer	MSc. (Hons) Agri. (FT)	Food Technology

FACULTY DISTRIBUTION BY PROGRAM AREAS IN FOOD TECHNOLOGY

Program area of specialization	Courses in the area and average number of sections per year	Number of faculty members in each area	Number of faculty with Ph.D. degree
Dairy Technology	3	02	02
Cereal Technology	4	03	02
Post harvest Technology	3	01	-
Food science	3	01	01
Total		07	04

The resume of faculty is given in Annex-III

Standard 6.2: Effective Programs for Faculty Development.

- Expert's training and availability of adequate research and academic facilities are provided to the faculty members according to the available resources.
- Presently one faculty member is abroad on study leave for post doctoral degree as sponsored by the HEC.
- Motivations in the form of allowances to theses supervisors have been implemented lately to promote high standard research.

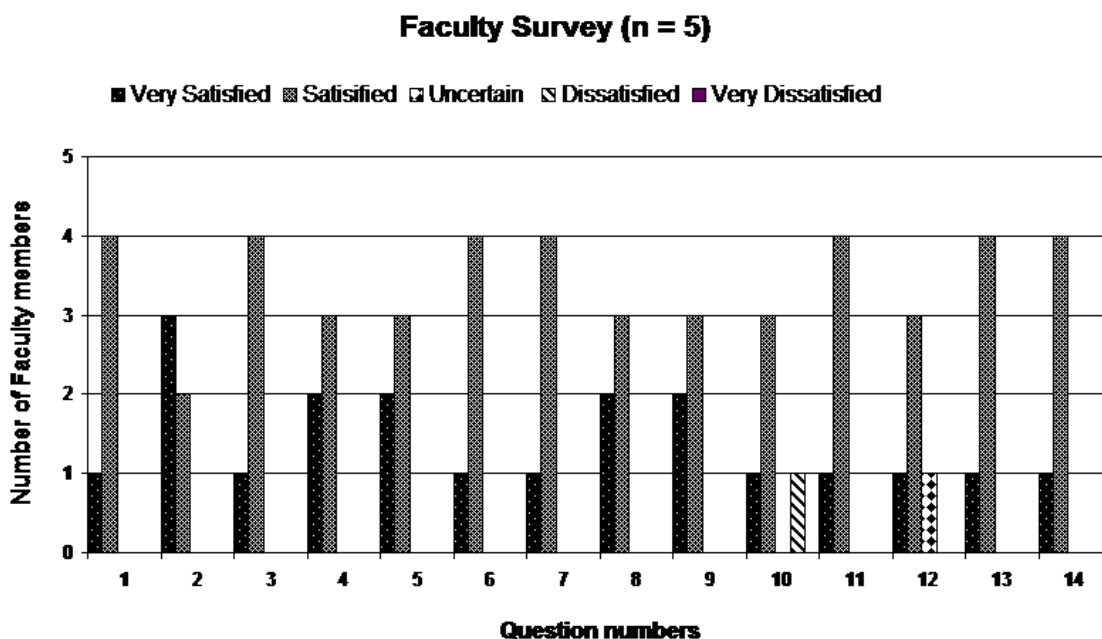
- Existing services include mainly internet access is improper, which is available through networking system in addition to library facility with latest books is also available.
- Active programs for faculty development has been just introduced since the last semester.

Standard 6.3: Faculty member motivation

- Time to time provision of passion to the young faculty by the senior faculty members.

Results of the faculty survey

Almost all the faculty members are contented regarding all the questions asked. Results are provided in Fig below.



* Questions:

1. Your mix of research, teaching and community service.
2. The intellectual stimulation of your work.
3. Type of teaching / research you currently do.
4. Your interaction with students.
5. Co-operation you receive from colleagues.
6. The mentoring available to you.
7. Administrative support from the department.
8. Providing clarity about the faculty promotion process.

9. Your prospects for advancement and progress through ranks.
10. Salary and compensation package.
11. Job security and stability at the department.
12. Amount of time you have for yourself and family.
13. The overall climate at the department.
14. Whether the department is utilizing your experience and knowledge.

Best Program Features:

- Supervision of students for research
- Cooperation from colleagues
- Conducive environment at the department
- Teaching and research together
- Clear job description
- Funds for Research projects

Programs that could improve your motivation:

- Research Laboratories need to be upgraded with more equipment
- More equipment and facilities needed
- More computer and internet facilities for students
- Improvement in teaching aids
- Opportunities for improving teaching skills and knowledge

SECTION 7:

CRITERION 7: INSTITUTIONAL FACILITIES

Standard 7-1: Infrastructure:

The institutional facilities do play a key role for effective research and teaching purposes. The faculty has access to E-library which is very helpful for the high quality education and producing research of international standard. They also have access to the internet. However the department has the following shortcomings/problems:

- The internet services provided by the university are of not high quality. The speed of internet is slow and often internet does not work. The telephones are also connected with the internet and the services are often breached.
- Majority of apparatus is outdated.
- Modern apparatus for cereal technology, Dairy technology, food microbiology, post harvest technology, nutrition are lacking.
- Inexpert supporting staff.
- Faculties lack practical knowledge of modern techniques.
- Flimsy budget for consumables.
- Lack of Research budget for Ph.D. students

Standard 7-2: Library Facilities:

Updated libraries are key for proper functioning of the knowledge resource. The University Central Library has very limited number of books, journals and periodicals. It's a small library in term of space and facilities with no catalogue systems. It does not meet the standards of a University Library. However department itself owns few books. Department is lacking own library faculty.

Standard 7.3: Class Room and Faculty Offices

Presently, the class rooms are not sufficient and the space is not only limited but also some basic facilities are lacking. Multimedia are not available for the lecture halls. Practical lab space is also missing. This affects the quality of teaching. The faculty offices are another serious problem of the department. Some faculty members are sharing small rooms and the other are having their desks in the laboratories.

SECTION 8:

CRITERION 8: INSTITUTIONAL SUPPORT

The university management has been struggling hard to strengthen all the departments and up gradation of departments and establishing new faculties and Institutes. The university is also trying to attract highly qualified faculty.

Standard 8-1: Support and Financial Resources

- Presently, department is having a very inadequate financial resource to maintain the present needs of the department. No research amount allocated for student research. Distinct research grants for students and faculty are mainly supporting the departmental research activities. Due to lack of proper services, the students conduct their research in National Agricultural Research Institute. There is a dire need for increasing the financial resources allocated to the department to establish a library, laboratories and computer facilities. Food Technology department has recently submitted a project for strengthening of department and it is hoped to be funded during the next year. Proposals and factors that can contribute to the motivation of the faculty are given as follows:
- Research grants for young faculty members may be allocated.
- Trainings should be arranged in abroad to train the faculty members.

Standard 8-2: High Quality Graduate Students and Research Scholars

Ph.D. students are enrolled in each semester. A strict merit policy is applied during admission coupled with GRE/NTS or entry test.

Standard 8-3: Financial Resources

Total budget of the department for research activities for the financial year 2016-18 was **Rs. 50000/-** which hardly fulfill the departmental needs particularly for the purchase of equipments, chemicals for laboratories and books for the department library.

Strength of the Department:

The main asset of the department is the availability of highly qualified teachers, with full acquaintance of their respective subjects, having vast knowledge of nutrition, local food industry problems. Most of the faculty members have local degrees and are experts in their fields.

Weakness Identified in the Program:

Progressive teaching and research is being handicapped due to lack of equipment as farinograph, mixograph, falling number, texture analyzer, cooling chambers, rotary evaporators Gel documentation, Freeze Dryer, ELISA colorimeter etc. for post-graduate students. Latest literature and reviews are hardly available. There is a need for short term foreign training to faculty members. Post-graduate laboratories also lacking with colorimeter, bomb calorimeter,

refrigerated centrifuge machine. Scarcity of budget for research is also a big problem. Lack of space in Labs require to construct more Labs and Lecturer rooms.

QUANTITATIVE ASSESSMENT OF THE DEPARTMENT

(Last three years)

Sr. #	Particular	No.	Remarks
iii	Ph.D.	08	In employment
iv	Students: Faculty ratio	14:1	
V	Technical : Non Technical ratio	2:1	
vi	Average grade point	3	Fulfills HEC criteria

The assessment process indicated high efficiency of system and satisfactory impact of outcomes. Almost all the graduate and post graduates got jobs in various organizations (provincial department, universities, research organizations, banks and food factories).

PRESENT PERFORMANCE MEASURES FOR RESEARCH ACTIVITIES

Faculty	Journal Publications (National & International)	Conference Publications (Proceedings/ Abstract)	Projects
Dr. Tariq Masud	73		02
Dr. Anwaar Ahmed	14	04	-
Mr. Asif Ahmad	08	-	-
Dr. Asma Sohail			
Dr. Kashif Sarfraz Abbasi			
Ms. Asia Latif	09	-	01

The department has shortage of staff; distinguishing feature is the availability of expertise (food microbiology, dairy technology, cereal technology, post harvest technology, nutrition and food safety).

The Department is providing following community Services:

- Advisory services to the fruit and vegetable growers on post harvest technology.
- Advisory services to different food industries.
- Short training courses on fruit and vegetable preservation
- Short training courses on bakery products

- Management and supervision of students of various departments.
- Supervision of students on internship in various food factories and research organizations.

Faculty Satisfaction Regarding the Administrative Services:

- The department upholds a ratio of 2:1 for the academic (technical) and administrative non-technical staff which fulfils this standard set by the HEC.
- Managerial meetings (departmental, university, academic council, and syndicate) are attended as and when required. Generally two meetings of academic council are held per year. Board of studies of the department meets quarterly.
- Rapid office work disposal; no complaint pertaining to delay has ever received from authorities.
- Suitable records of individual students, their theses etc. are maintained.

SUMMARY AND CONCLUSIONS

Food Technology a core discipline associated with agriculture that covers all aspects of Food production and its management through processing and preservation. The Task of Food Technology department is to equip and impart training to students for high-quality education for their valued and productive living. The Ph.D. in Food Technology was initiated in 2001. The courses aim to develop and reinforce students' capacity to grasp principles and practices Food Technology based on scientific principles. The solid academics allow them to specialize in one or more areas reflecting the student's particular interest. Specialties in Food Technology have input of the current concepts of processing and preservation. Ph.D students obtain scientific background as well as having gained experience in problem solving and have developed the communication, numerical and computer skills required for a wide range of careers. In order to assess whether department is fulfilling its objectives or not, surveys on various aspects such as course evaluation, teacher evaluation, alumni survey, research/graduating students surveys and faculty survey etc. have been conducted by the departmental members of the program team. The data was obtained on prearranged proformas and later on analyzed and presented in the form of graphs and tables. The data revealed that students are satisfied with the subject approach of faculty members, their fairness in examination, and level of knowledge. However, the partial availability of lecture rooms and poor laboratories infrastructure were reported as major hurdles. Course evaluation survey showed that students are satisfied with workload and value of knowledge provided to them. According to research student survey, accessibility of internet and access to various scientific journals is limited. Similarly, the department has limited budget for research purposes which cannot maintain laboratories and research activities. According to employer survey, students are good at job but they have very basic knowledge of information technology and computer skills. Faculty members are pleased with their salaries but they have severe concerns about the workload as most of them are agreed that they have very less time for themselves. Overall, the program of study was rated very good. The Department has highly qualified and experienced faculty mostly having post doctorate research experience from universities of worldwide reknown. The faculty has produced more than seventy publications during the last five years in journals of national and international repute. Moreover, 2 research projects were completed during the reported period; lack of infrastructure to transfer the recommended practices and technology to farmers. Access to latest literature and availability of

updated review is not up to the mark. There is a need for short foreign trainings of young faculty members.

The performance of the department may be further improved considering;

- Split class rooms are required to facilitate the Ph.D students to continue laboratory works without breaks.
- There is a inaccessibility of high speed internet which creates many impediments. Improvement in this area will also speed up the level of research and teaching,
- Departmental Laboratories need intensification through new equipments.
- Presently, there are no planning for professional training of the staff. Such trainings will improve their skills for the quality of research and teaching. It would be worthy to point out here that proper man at proper place is not being practiced.
- The budget assigned to the department hardly meets the requirements of the research,
- Financial support for proper Departmental library is a genuine need. Allocation of sufficient funds for this purpose will be helpful in improvement in knowledge resource of students.

Annexure ii

Name	Prof. Dr. Tariq Masud		
Personal	Chairman, Department of Food Technology, PMAS Arid Agriculture University, Rawalpindi Office: (92) 51-9290964; Cell: (92) 300-9540524; Fax: (92) 51-9290160 E-mail: drmasud_tariq@hotmail.com		
Experience	<u>February 3rd 2007 – present.</u> Chairman/Professor. Department of Food Technology, PMAS Arid Agriculture University Rawalpindi, Pakistan. <u>December 1st, 1999 – Feb. 2007</u> Chairman/Associate Professor. Department of Food Technology, PMAS Arid Agriculture University Rawalpindi, Pakistan. <u>September 1, 1999 – January 15th, 2000.</u> Visiting Faculty. Department of Biological Sciences, PMAS Arid Agriculture University Rawalpindi, Pakistan. <u>March-July, 2006.</u> Visiting Faculty. Department of Botany, University of Azad Jammu & Kashmir, Muzaffarabad <u>October 25, 1997 - Febraury 8, 1998.</u> Visiting Faculty. Department of Food Technology, PMAS Arid Agriculture University Rawalpindi, Pakistan. <u>January, 1989 - November, 1999.</u> Research Scientist. Dairy Technology Lab., Animal Sciences Institute, National Agricultural Research Centre, Islamabad, Pakistan. <u>May, 1983 - December, 1988.</u> Technical Officer. Dairy Technology Lab., Animal Sciences Institute, National Agricultural Research Centre, Islamabad,		
Honors and Awards	➤ Endeavor Award for Post Doc in Australia ➤ Preparation of Curriculum for Food Science and Technology for B. Sc. (Hons.), M. Sc./M. Sc. (Hons.) and Ph. D. Program ➤ Salam Pakistan Youth Award, 2005 in Field of Science and Technology ➤ Sitara Award, 2009 ➤ Best Teacher Award 2014		
Memberships	Member, Faculty Board, University of Arid Agriculture, Rawalpindi. Member Academic Council, UAAR		
Academics	Degree	Field	Institution
	Post Doc	Food Technology	Australia
	Ph. D.	Biotechnology	Quaid-i-Azam University, Islamabad, Pakistan
	M. Phil.	Food Microbiology	Quaid-i-Azam University, Islamabad, Pakistan
	M.Sc.	Life Sciences	Quaid-i-Azam University, Islamabad, Pakistan
	B.Sc.	Life Sciences	Punjab University Lahore, Pakistan
Service activity	➤ Industrial Microbiology and Biotechnology. ➤ Food Microbiology. ➤ Milk and milk products processing ➤ Food toxicology ➤ Dairy microbiology ➤ Quality Assurance Management ➤ Postgraduate Research ➤ Honors Research		

Research Interest	➤ Dairy Technology ➤ Food Microbiology/Safety ➤ Post Harvest Technology ➤ Nutraceuticals ➤ Product Development
Publications	<u>List of Research Publications During the Last Five Years i.e. from</u> 1. Shafiq, H., A. Ahmad, T. Masud and M. Kaleem. 2014. Cardio-protective and anti-cancer therapeutic potential of miraculous herb <i>N. sativa</i>. <i>Iranian Journal of Basic Medical Science</i>. 17:967-979. (Impact Factor: 0.604) 2. Imran. M., T. Masud and H. A. Skanadr. 2014. Studies on physiochemical imensions of two basmati (superbasmati, basmati 385) and two non-basmati (ks-282, ir-6) pakistani commercial rice varieties. <i>Journal of Global Innovative Agriculture Social Science</i>. 2(3): 120-122. (Short Communication) 3. Mahmood, T. and T. Masud. 2014. Optimization and partial characterization of bacteriocin produced by <i>Lactobacillus bulgaricus</i> – TLBFT06 isolated from dahi. <i>Pakistan Journal of Pharmaceutical Sciences</i>. 28: (1). (Impact Factor: 1.103) 4. Mahmood, T., T. Masud and A. Sohail. 2014. Some probiotic and antibacterial properties of <i>Lactobacillus acidophilus</i> cultured from dahi a native milk product. <i>International Journal of Food Science and Nutrition</i>. DOI: 10.3109/09637486.2014.880666 (Impact Factor: 1.257) 5. Ali, S., T. Masud, K. S. Abbasi, T. Mehmood and A. Ali. 2014. Some Physicochemical and Functional attributes of six indigenous apricot genotypes from Gilgit Baltistan, Pakistan. <i>International Journal of Biosciences</i>. 4(2): 221-231. (Impact Factor: 0.032) 6. Tariq, S., T. Masud, S. Tariq and A. Sohail. 2014. Black Seed (<i>Nigella sativa</i>) Possess Bioactive Compounds Act as Anti-<i>Helicobacter pylori</i> Agent. <i>World J Pharm Sci.</i>, 2(2); 203-209. (Impact Factor: 1.877) 7. Ali., A., T. Masud. S. Ali., K. S. Abbasi and S. Hussain. 2014. Influence of water soluble coatings on postharvest quality of sweet cherry (<i>Prunes avium</i> L.) grown in Gilgit_Baltistan. <i>International Journal of Biosciences</i>. 4(1): 252-263. (Impact Factor: 0.032) 8. Akram, A., A. Sohail, T. Masud, A. Latif, S. Tariq, S. J. Butt and I. Hassan. 2014. Physico-chemical and antimicrobial assessment of honey of <i>Apis dorsta</i> from different geographical regions of Pakistan. <i>International Journal of Agricultural Science and Research</i>. 3(2): 025-030. (Impact Factor: 4.3594) 9. Adeel, R., A. Sohail and T. Masud. 2014. Characterization and antibacterial study of pumpkin seed oil (<i>Cucurbita pepo</i>). <i>Life Sciences Leaflets</i>. 49: 53-64. (Impact Factor: 1.22) 10. Masood, M., T. Masud, S. Tariq and A. Sohail. 2014. The effect of casein

	hydrolysate formed by probiotic culture on cholesterol reduction. <i>Life Sciences Leaflets</i>. 49: 116-127. (Impact Factor: 1.22) 11. Muhammad, A. B., Z. Mehmood, M. F. H. Munhis, H. J. Chaudhary, T. Masud, T. Mehmood, M. I. Haider and M. Imran. 2014. Comparative Biodiesel production potential of Food Waste oils as Renewable energy source. <i>Asian Journal of Chemistry</i>. 26(2): 527-530. (Impact Factor: 0.355) 12. Ali, S., T. Masud, K. S. Abbasi, A. Ali and A. Hussain. 2013. Some compositional and biochemical attributes of jaman fruit (<i>Syzygium cumini</i> L.) from Potowar region of Pakistan. <i>Research in Pharmacy</i>. 3(5): 01-09. (Impact Factor: 0.355) 13. Hussain, S., T. Masud, S. Ali, R. Bano and A. Ali. 2013. Some physico-chemical attributes of pear (<i>Pyrus communis</i> L.) cultivars grown in Pakistan. <i>International Journal of Biosciences</i>. 3(12): 206-215. (Impact Factor: 0.032) 14. Adeel, R., A. Sohail and T. Masud. 2013. Characterization and antibacterial study of pumpkin seed oil (<i>Cucurbita pepo</i>). <i>Life Sciences Leaflets</i>. (Accepted). (Impact Factor: 1.22) 15. Mahmood, T., T. Masud, I. Muhammad, I. Ahmed and N. Khalid. 2013. Selection and characterization of probiotic culture of <i>S. thermophilus</i> from Dahi. <i>International Journal of Food Sciences and Nutrition</i>. 64 (4): 494-501. (Impact Factor: 1.257) 16. Hassan, O., S. Yi, F. Sonia, L. Michael, R. U. Ata, M. Rodney, T. Masud and A. Samson. 2013. Biophenols and Antioxidant Properties of Australian Canola Meal. <i>Journal of Agricultural and Food Chemistry</i>. 61(38): 9176-9184. (Impact Factor: 3.107) 17. Irshad, I., A. Kanekanian, A. Peters and T. Masud. 2013. Antioxidant activity of bioactive peptides derived from bovine casein hydrolysate fractions. <i>Journal of Food Science and Technology</i>. DOI 10.1007/s13197-012-0920-8. (Impact Factor: 2.024) 18. Mahmood, T., T. Masud. 2013. Some probiotic and antipathogenic properties <i>Lactobacillus acidophilus</i> cultured from dahi. <i>International Journal of Food Sciences and Nutrition</i>. (Accepted CIJF-2013-0216.R2). (Impact Factor: 1.257) 19. Ali, S., T. Masud, T. Mahmood, K. S. Abbasi and A. Ali. 2013. Influence of CaCl₂ on Physico-chemical, Sensory and Microbial Quality of Apricot cv. Habi at Ambient Storage. <i>International Journal of Green and Herbal Chemistry</i>. (Accepted JCBSC:677). (Impact Factor: 0.801) 20. Khan, R. S. and T. Masud. 2013. Comparison of buffalo cottage cheese made from aqueous extract of <i>Withania coagulans</i> with commercial calf
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	Lactobacillus spp. Isolated from fermented milk product dahi. Food Sci. Technol. Res., 18 (1), 91–98. (Impact Factor: 0.67) 32. Ali, S., T. Masud and K. S. Abbasi. 2011. Physico-chemical characteristics of apricot (<i>Prunus armeniaca</i> L.) grown in Northern Areas of Pakistan. Scientia Horticulturae. 130, 386-392. (Impact Factor: 1.913) 33. Abbasi, K. S., T. Masud and S. Ali. 2011. Physico-chemical, functional and processing attributes of some potato varieties grown in Pakistan. African Journal of Biotechnology . 10(84): 19570-19579. (Impact Factor: 0.57) 34. Masud. T., S. Maqsood and S. Sammi. 2011. Molecular characterization and comparison of lactococcal phages of Pakistan and Germany. International Journal of Dairy Technology. 64(3), 433-436. (Impact Factor: 1.099) 35. Javed, A., T. Masud, Q. Ul-Ain, M. Imran and S. Maqsood. 2011. Enterocins of <i>Enterococcus faecium</i>, Emerging Natural Food Preservatives. Annals of Microbiology. 61: 699-708. (Impact Factor: 1.039) 36. Nawaz, M. A., T. Masud, S. Sammi. 2011. Quality evaluation of mozzarella cheese made from buffalo milk by using paneer booti (<i>Withania coagulans</i>) and calf rennet.. International Journal of Dairy Technology. 64(2), 218-226. (Impact Factor: 1.099) 37. of Food Science and Technology. 44, 918-926. (Impact Factor: 1.354)
Research Grant	➤ Quality of raw milk at different intervals during its distribution. ➤ Evaluation and improvement of indigenous method of yoghurt making. ➤ A survey of indigenous cheese production and distribution in NWFP and northern areas. ➤ Evaluation and improvement of indigenous cheese prepared from buffalo, cow and buffalo toned milk. ➤ To develop a technology for preparation of yoghurt and cheese at household level. ➤ Preservation of Raw milk by activation of its Lactoperoxidase system prior to utilize in milk products. ➤ Enterotoxigenicity of <i>S. aureus</i> isolated from milk and milk products. ➤ Screening of indigenous dahi for the selection of defined starter culture ➤ Preparation of Mozzarella cheese from buffalo milk, using Starter Culture Technique (SCI) and Direct Acidification Technique (DAT). ➤ Studies for the improvement of paneer (channa) making technology from buffalo milk. ➤ Propagation and preservation of starter culture of yoghurt. ➤ “Selection and characterization of starter culture for fermented milk products” from Higher Education Commission, Pakistan. ➤ “Studies for the selection of probiotic cultures for yoghurt making.” Pakistan Science Foundation, Pakistan.
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Research or Creative	1. <u>Aloe vera coating of Potato chips.</u> Kashif Sarfraz Abbasi , Tariq Masud Sartaj Ali and Muhammad Jahangir. Patent Application No.

Accomplishments	0703/2013. Publication No. US2015/0030735 A1. Publication date, Jan. 29, 2015. The Patent Office, USA. 2. <u>Packaging System for Tomato Fruits.</u> Tariq Masud and Shehla Sammi. Patent Application No. 484/2005. The Patent Office, Government of Pakistan. 3. <u>Natural Preservative in Bread making.</u> Tariq Masud, Asia Latif and Shehla Sammi Applied for patent: Patent Application No. 587/2005. The Patent Office, Government of Pakistan. 4. <u>Storage System for Mangoes var. late Chaunsa at Low Temperature.</u> Tariq Masud, Nuzba Anjum and Shehla Sammi. Patent Application No. 1092/2005. The Patent Office, Government of Pakistan. 5. <u>Cottage cheese making by C. procera latex.</u> Tariq Masud, Saima Razzaq and Shehla Sammi. Patent Application No. 594/2006. The Patent Office, Government of Pakistan. 6. <u>Regulation of glucose and lipid profile in Type 2 Diabetic patients by using Nigella sativa seed powder.</u> Tariq Masud and Ahmad Bilal. Patent Application No. 623/2007. The Patent Office, Government of Pakistan. 7. <u>Mozzeralla cheese preparation using paneer booti (Withania coagulans).</u> Tariq Masud, Malik Adil Nawaz and Shehla Sammi. Patent Application No. 1283/2007. The Patent Office, Government of Pakistan.
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Name	Prof. Dr. Asif Ahmad
Personal	CNIC# 37101-1683263-1 Postal / permanent address: House No. 7, Darul-Islam colony, Kamra Road, Near Al-Furqan Mosque, Attock city, 43600, Pakistan. Mobile: +92-3345628182 Email: asifahmad_1@yahoo.com asifahmad@uaar.edu.pk Official Address : Associate Professor, Department of Food Technology, PMAS_Arid Agriculture University, Rawalpindi, Pakistan
Experience	• Associate Professor, May 2010 – Todate PMAS_ AAUR • Assistant Professor, Dec 2005 to May 2010 PMAS_ AAUR • Lecturer. April 1998 to Dec 2005 UAAR • Trainee Officer Jan 1998 to April 1998 Habib sugar mills
Honors and Awards	• Win Indigenous PhD scholarship from Higher education commission (HEC), Pakistan. • Win University merit scholarship from University of Agriculture, Faisalabad, Pakistan. • HEC Approved supervisor to conduct PhD Research at University level. • Win Fulbright exchange scholar award for postdoc in USA 2013 • Win Research productivity Award 2012 • Win research productivity Award 2014
Memberships	• Member of Pakistan Society of Food Scientists and Technologists. • Pakistan Botanical Society • Senior Member of Asia-Pacific Chemical, Biological & Environmental Engineering Society (APCBEEES) • Member of IFT • Member of Sigma XI
Academics	2004–2009 University of Agriculture Faisalabad, Pakistan PhD Food Technology. CGPA 3.83 / 4.00 1995-1997 University of Agriculture Faisalabad, Pakistan M.Sc (Hons) Food Technology. CGPA 3.93 / 4.00

	1990-1995 University of Agriculture Faisalabad, Pakistan B.Sc (Hons) Agriculture Major Food Technology. CGPA 3.64 / 4.00. 1988-1990 F.Sc (Pre-Medical) Ist Division 1988 Matric Ist Division
Service activity	• Prepared and delivered lectures in the field of Food Technology at under graduate and post graduate level. • Supervised the research activities of undergraduate and postgraduate students, and assisted in thesis write up at post graduate level. • Serving as member of supervisory committee of post graduate students for research and thesis in various disciplines. • As member of board of studies, developed new coursework for both undergraduate and post graduate classes. • Served as laboratory in-charge • Managed and supervised activities in labs and Food processing unit.
Research Interest	○ Food Science & Technology ○ Nutrition ○ Nutraceuticals
Publications	1. Hayat I, Ahmad A, Ahmed A, Khalil S and Gulfranz M. 2014. Exploring the potential of red kidney beans (<i>phaseolus vulgaris</i> L.) To develop protein based product for food applications. The Journal of Animal & Plant Sciences, 24(3): 860-868. ISSN: 1018-7081 2. Ahmed A, Khalid N, Ahmad A, Abbasi N A, Latif M S Z and Randhawa M A. 2014. Phytochemicals and biofunctional properties of buckwheat: A review . The Journal of Agricultural Science, 152, pp 349-369. doi:10.1017/S0021859613000166. 3. Ahmed A, Ahmad A, Khalid N, Shandhu MA, Rhandhawa MA, Suleria HAR. 2014. A question mark on Iron deficiency in 185 million people of Pakistan: Its outcomes and Prevention. Critical Reviews in Food science and Nutrition. 54:1617-1635. 4. Abassi EA, Khalid N, Zbakh H and Ahmad A. 2014. Physicochemical characteristics, nutritional properties and health benefits of argan oil: A review. Critical Reviews in Food Science and Nutrition. 54:1401-1414. DOI: 10.1080/10408398.2011.638424. 5. Ahmad A, Hayat I, Arif S, Masud, T, Khalid N, Ahmed A. 2014. Mechanisms involved in the therapeutic effects of soybean (glycine max). International Journal of Food Properties. 17(6):1332-1354. 6. Anjum N, Maqsood S, Masud T, Ahmad A and Momin A. 2014.

	<i>Lactobacillus acidophilus</i>: Characterization of the Species and Application in Food Production. Critical Reviews in Food science and Nutrition. 54:1241-1254. 7. Tasneem M, Siddique F, Ahmad A, Farooq U. 2014. Stabilizers: Indispensable substances in dairy products of high rheology. Critical Reviews in Food science and Nutrition. 54:869-879. 8. Shafiq H, Ahmad A, Masud T, Kaleem M. 2014. Cardio-protective and anti-cancer therapeutic potential of Nigella sativa. Iranian Journal of Basic Medical Sciences. 17(12):967-979. 9. Khalid N, Ahmad A, Khalid S, Ahmed A, Irfan M. 2014. Mineral composition and health functionality of Zamzam water: A review. International Journal of Food Properties. 17(3):661-677. 10. Ahmad A, Arshad N, Ahmed Z, Bhatti MS, Zahoor T, Ahmad Z and Afreen A. 2014. Perspective of surface active agents in baking industry: An overview. Critical Reviews in Food science and Nutrition. 54: 208-224. 11. Hayat I, Ahmad A, Masud T, Ahmed A and Bashir S. 2014. Nutritional and Health Perspectives of Beans (<i>Phaseolus vulgaris</i> L.): An Overview. Critical Reviews in Food science and Nutrition. 54: 580-592. DOI:10.1080/10408398.2011.596639. 12. Shafiq H, Iftikhar F, Ahmad A, Kaleem M, and Sair AT. 2014. Effect of crystallization on the water activity of honey. International Journal of Food and Nutritional Sciences, 3(3):1:6. 13. Chatha, Z. A., Ahmad, A., Zahoor, T., & Raza, A. (2013). Comparative Effect of Gamma Irradiation, UV-C and Hot Water on Antioxidant Potential of Mango (<i>Mangifera indica</i> L.) Fruit. <i>Pakistan Journal of Nutrition</i>, 12(11), 1019-1023. 14. Chatha, Z. A., Ahmad, A., Zahoor, T., Raza, A., & Kaleem, M. (2013). Effect of Gamma Irradiation, UV-Irradiation and Hot Water Treatment on Fungal Growth and Aflatoxin in Mango Fruits (<i>Mangifera indica</i> L.). <i>Pakistan Journal of Nutrition</i>, 12(12), 1050-1056. 15. Akhtar, S., Ahmed, A., Ahmad, A., Ali, Z., Riaz, M., & Ismail, T. (2013). Iron status of the Pakistani population-current issues and strategies. <i>Asia Pacific journal of clinical nutrition</i>, 22(3). 340-347. doi: 10.6133/apjcn.2013.22.3.17 16. Ahmed, Z., Wang, Y., Anjum, N., Ahmad, H., Ahmad, A., & Raza, M. (2013). Characterization of new exopolysaccharides produced by coculturing of <i>L.</i>
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	<i>kefiranofaciens</i> with yoghurt strains. <i>International journal of biological macromolecules</i>, 59, 377-383. 17. Ahmed Z, Wang Y, Anjum N, Ahmad A, Khan ST. (2013). Characterization of exopolysaccharide produced by <i>Lactobacillus kefiranofaciens</i> ZW3 isolated from Tibet kefir- Part II. <i>Food Hydrocolloids</i>. 30: 342-350. 18. Mehmood, T., Ahmad, A., Ahmed, A., Wakeel, A., Khan, A. S., Baig, H. H., & Rafique, A. (2013). Physico-chemical and sensory evaluation of different vanaspati ghee available in Pakistan. <i>Innovative Romanian Food Biotechnology</i>, 12. 19. Ahmed Z, Wang Y , Ahmad A, Khan ST, Nisa M, Ahmad H and Afreen A. 2013. Kefir and Health: A Contemporary Perspective. <i>Critical Reviews in Food science and Nutrition</i>. 53(5):422-434. DOI: 10.1080/10408398.2010.540360. 20. Ahmed A, Anjum M, Ahmad A, Khalid N, Randhawa MA, Ahmad Z, Farid W. 2013. Effects of Hydrocolloids on Partial Baking and Frozen Storage of Wheat Flour Chapatti . 19 (1), 97 – 103. 21. Adnan M, Ahmad A, Ahmed A, Khalid N, Hayat I, Ahmed I. 2013. Chemical Composition and Sensory Evaluation of Tea (<i>Camellia Sinensis</i>) Commercialized In Pakistan. <i>Pak. J. Bot.</i>, 45(3):901-907 22. Dilshad, SMR, Rehman NU, Ahmad N, Iqbal A, Ali MA, Ahmad A. 2012. Effect of flax seeds (<i>Linum usitatissimum</i>) on uterine and ovarian protein contents, ovarian cholesterol, serum estradiol and onset of puberty in immature female mice. <i>Int. J. Agric. Biol.</i>, 14: 781–786. 23. Yousaf, A. A.; Ahmed, A.; Hameed, T.; Ahmad, A.; Randhawa, M.A.; Sabir, M.; Hayat, I.; Khalid, N. 2013. Nutritional and functional evaluation of wheat flour cookies supplemented with gram flour. <i>International Journal of Food Science and Nutrition</i>. 64(1): 63-68. 24. Ahmed A, Malik NA, Randhawa MA, Ahmad A, Akhtar S, Ahmed H, Shah SS. 2012. Changes in vegetable oil used for commercial frying: A case study from Rawalpindi. <i>Journal of the Chemical Society of Pakistan</i> 34(5): 1079-1083. 25. Arif S, Ahmad A, Masud T, Khalid N, Hayat I, Siddique F, Ali Muhammad. 2012. Effect of flour processing on the quality characteristics of a soy based beverage. <i>International Journal of Food Science and Nutrition</i>. 63(8):940-946. 26. Ahmad A, Munir B, Abrar M, Bashir S, Adnan M, Tabassum T. 2012. Perspective of β -glucan as functional ingredient for food industry. <i>Journal of Nutrition and Food Sciences</i>. 2: 133. doi:10.4172/2155-9600.1000133. 27. Waqas, A, Ahmed A, Ahmad A, Rhandhawa M. A. Khalid, N. 2012. Heavy metal contamination in vegetables grown in Rawalpindi, <i>Journal</i>
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	of the Chemical Society of Pakistan. 34(4):914-919. 28. Ahmad A, Anjum FM, Zahoor T, Nawaz H and Dilshad SMR.2012. Beta glucan: A valuable functional ingredient in foods. Critical Reviews in Food Science and Nutrition. 52 (3):201-212. 29. Zafar S,Ahmed A, Ahmad R, Randhawa MA, Gulfraz M, Ahmad A and Siddique F. 2012. Chemical residues of some pyrethroid insecticides in eggplant and okra fruits: Effect of processing and chemical solutions. Journal of the Chemical Society of Pakistan 34(4): 1169-1175 30. Mehmood T, Ahmad A, Ahmed A, Khalid N. 2012. Quality Evaluation and Safety Assessment of Different Cooking Oils Available in Pakistan. Journal of the Chemical Society of Pakistan 34(3): 518-525. 31. Siddique F, Tasneem M, Ahmad A, Ahmed A, Gulfraz M and Watto FH. 2011. Development and optimization of sweet cream butter from buffaloes at cottage scale. African Journal of Biotechnology. 75(10), 17265-17274. 32. Khan AN, Ahmed A, Bhatti MS, Randhawa MA, Ahmad A and Yousaf AA. 2011. Effect of Additives on the Shelf Life Extension of Chapatti. Food Science and Technology Research. 17(3): 203-208. 33. Ahmad A and Ahmed Z. 2011. Tailoring oat for future foods. NOVA SCIENCE PUBLISHERS, USA. (BOOK CHAPTER) 34. Ahmad A, Anjum FM, Zahoor T, Nawaz H and Ahmed Z. 2010. Extraction and characterization of β-glucan from oat for industrial utilization. Int. J. Biologic. Macromolec., 46(3): 304-309. 35. Ahmad A and Anjum FM. 2010. Perspective of β-glucan: Extraction and Utilization. VDM Publishers Germany . 36. Ahmad A, Anjum FM, Zahoor T, Din A and Nawaz H. 2009. Physicochemical and functional properties of barley β-glucan as affected by different extraction procedures. Int. J. Food Sci. and Tech., 44: 181-87. 37. Ahmad M, Ahmad A, Chatha ZA and Dilshad SMR. 2009. Studies on preparation of ready to serve mandarin (<i>Citrus reticulata</i>) diet drink. Pak. J. Agric. Sci., 45 (4): 470-476. 38. Ahmad A, Anjum FM, Zahoor T and Nawaz H. 2009. Extraction of β-glucan from oat and its interaction with glucose and lipoprotein
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	profile. Pak. J. Nutrition. 8 (9): 1486-1492. 39. Gulfraz M, Kasuar R, Arshad G, Mehmood S, Minhas N, Asad MJ, Ahmad A and Siddique F. 2009. Isolation and characterization of edible oil from wild olive. African J. Biotech., 8 (16): 3734-3738. 40. Ahmad A, Anjum FM, Zahoor T and Nawaz H. 2008. Effect of barley β-glucan on sensory characteristics of bread. Pak. J. Agric. Sci., 45(1): 88-94. 41. Kashif SA, Mahmood H and Ahmad A. 2004. Effect of different ethylene absorbents on the storage of banana (<i>Musa cavendishii</i> cv. Basrai). Pak. J. Arid. Agric., 7(1): 1-11. 42. Kashif SA, Ahmad A and Muhammad A. 2004. Effect of water soluble coatings on the storage of bananas (<i>Musa cavendishii</i> cv. Basrai). Pak. J. Arid. Agric., 7(1): 73-82. 43. Jahangir M, Masud T, Ahmad A. 2002. Effect of different stabilizers on brix, acidity and ascorbic acid contents of Tomato concentrate. Pak. J. Food Sci., 12(1-2): 45-48. 44. Amin A, Ali M, Ahmad A and Hassan M. 2001. Effect of coatings and Polyethylene sheet on the shelf life of mangoes (<i>Mangifera indica</i> L.). Pak. J. Arid. Agric., 4(1-2): 7-13. 45. Ali M, Saeed MK, Ahmad A and Nasreen A. 2000. Stabilization and preservation of yoghurt drink. Pak. J. Arid. Agric., 3(1-2): 33-37.
Research Grant	
Research or Creative Accomplishments	• Develop low cost indigenous methods for extraction of dietary fibers from cereal source • Extraction of proteins from <i>Phaseolus vulgaris</i> • Food Product development • Development of web based shiny applets for data analysis

Name	Dr Anwaar Ahmed		
Personal	Father Name: Zahoor Ahmad Domicile: Khushab (Punjab) Pakistan N.I.C #: 38201-1179606-1 Date of Birth: 04 th May, 1963 Official address: Associate Professor Food Technology Department of Food Technology, PMAS- Arid Agriculture University Rawalpindi Cell #: +92-300-6657787 Phone (Off); +92-51-9292136 Email: anwaarft@gmail.com ; anwaarft@uaar.edu.pk		
Experience	Assistant Research Officer at Ayub Agriculture Research Institute Faisalabad Pakistan (1988 to 1991) (2 years 6 months) Agricultural Officer Department of Agriculture, Govt. of Punjab (1991-2007) (17 years) Assistant Professor Department of Food Technology since 25-05-2007 - 27-03-2014 (6 years 09 months) Associate Professor Department of Food Technology since 27-03-2014 to date		
Honors and Awards	1. Research productivity Award 2013 by Ministry of Science & Technology, Islamabad		
Memberships	- Life Member Pakistan Society of Food Scientists and Technologists. - Member board of studies of Food & Nutrition Department GC University, Faisalabad - Member board of studies Department of Food Science The Poonch University Rawalakot AJK Pakistan - Member National Technical Working Group of IPC Food Security ---FAO Pakistan		
Academics	Qualification	Period	Institution
	Ph D	2003-2007	Uni. of Agric. Faisalabad
	Post-Graduation	1987-1989	Uni. of Agric. Faisalabad
	Graduation	1982-1986	Uni. of Agric. Faisalabad
	F.Sc. (Pre-Medical)	1979-1981	HSC BISE Sargodha
	Matric	1976-1978	SSC BISE Sargodha
Service activity	<u>Associate Professor (Food Technology)</u> - Prepare and deliver lectures in the field of Food Technology to under and post graduate students. - Supervise M.Sc.(Hons.)/Ph. D Food Technology students and assisted in their thesis write up - Serving as member of supervisory committee of students for research and thesis in various disciplines - Working on sophisticated analytical equipments - As member of board of studies, developed new coursework for both under and post graduate classes - Suggest and worked for new food product development by utilizing local resources. - HEC Approved supervisor to conduct PhD Research at University level <u>Responsibilities as Senior Tutor</u>		

	• To promote communication skills and critical thinking among the students • To enhance understanding of socio-economic and political issues among the students of various regions • To divert energies of students towards healthy activities and creative thinking • To encourage tolerance, non-violence, and respect for others
Research Interest	• Cereal Technology • Post Harvest Technology • Human Nutrition • Food Safety
Publications	1. Ahmed A, M Anjum, A Ahmad, MA Randhawa, Z Ahmad, N Khalid, W Farid. 2013. Effect of hydrocolloids on partial baking and frozen storage of wheat flour chapatti. Food Science and Technology Research 19(1): 97-103 (Impact Factor 0.56) https://www.jstage.jst.go.jp/article/fstr/19/1/19_97/article 2. Sandhu MA, AA Saeed, MS Khilji, A Ahmed, N Khalid. 2013. <u>Genotoxicity evaluation of chlorpyrifos: A gender related approach in regular toxicity testing</u>. The Journal of Toxicological Sciences 02/2013; 38(2):237-244 (Impact Factor 1.893) https://www.jstage.jst.go.jp/article/jts/38/2/38_237/pdf 3. Ahmed A, N Khalid, A Ahmad, NA Abbasi, MSZ Latif, MA Randhawa. 2013. Phytochemicals and biofunctional properties of buckwheat: A review. Journal of Agricultural Science, 38(2): 237-244 Cambridge University Press (Impact Factor 2.878) http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=8875728 4. Akhtar S, A Ahmed, A Ahmad, Z Ali, M Riaz, T Ismail 2013. Iron Status of Pakistani Population-Current Issues and Strategies. <u>Asia Pacific Journal of Clinical Nutrition</u>. 22(3):340-7 (Impact Factor 1.13) http://www.ncbi.nlm.nih.gov/pubmed/23945403 5. Randhawa MA, FM Anjum, A Ahmed and MS Randhawa. 2007. Field incurred chlorpyrifos and 3,5,6-trichloro-2-pyridinol residues in fresh and processed vegetables. Food Chem. 103 (3) 1016-1023. (Impact Factor 3.66) http://www.sciencedirect.com/science/article/pii/S0308814606007849 6. Siddique F, KS Khan, A Ahmad, A Ahmed, M Gulfraz, FH Wattoo. 2011. Development and optimization of sweet cream butter from buffaloes at cottage scale. African Journal of Biotechnology. 10(75): 17265-17274 (Impact Factor 0.57) http://www.academicjournals.org/ajb/PDF/pdf/2011/28Nov/Siddiquepercent20etpercent20al.pdf 7. Zafar S, A Ahmed, R Ahmad, MA Randhawa, M Gulfraz, A Ahmad, F Siddique. 2012. Chemical residues of some pyrethroid insecticides in eggplant and okra fruits: effect of processing and chemical solutions. J Chem Soc Pak 34 (5): 1169-1175 (Impact Factor 1.38) http://jcsp.org.pk/PublishedVersion/e91f19b0-325d-44ac-aaac-c2162f0af728 <u>Manuscriptpercent20nopercent2021,</u> <u>percent201stpercent20Gallypercent20proofpercent208954percent20_Anwerpercent20Ahmed</u> <u>_pdf</u> 8. Randhawa MA, FM Anjum, MS Randhawa, A Ahmed, U Farooq, M Ibrar and MA Randhawa. 2008. Dissipation of deltamethrin on supervised vegetables and removal of its residue by household processing. Journal of the Chemical Society of Pakistan, 30:(02) 227-231 (Impact Factor 1.38) http://jcsp.org.pk/ArticleUpload/657-2762-1-RV.pdf

9. Ahmad Z, MS Butt, FM Anjum, MS Awan, HA Rathore, MT Nadeem, A Ahmed and A Khaliq. 2012. Effect of corn cobs concentration on xylanase biosynthesis by *Aspergillus niger*. African Journal of Biotechnology Vol. 11(7): 1674-1682 (Impact Factor 0.57) <http://www.academicjournals.org/ajb/PDF/pdf2012/24Jan/Ahmadpercent20etpercent20al.pdf>
10. Mehmood T, A Ahmad, A Ahmed and N Khalid. 2012. Quality Evaluation and Safety Assessment of Different Cooking Oils Available in Pakistan. J Chem Soc Pak. 34 (3): 518-525 (Impact Factor 1.38) <http://jcsp.org.pk/ArticleUpload/4394-20718-1-CE.pdf>
11. Khan W, A Ahmed, A Ahmad, MA Randhawa, R Ahmad and N Khalid. 2012 Heavy metal contamination in vegetables grown in Rawalpindi, Pakistan. J Chem Soc Pak. 34 (4): 914-919 (Impact Factor 1.38) <http://jcsp.org.pk/ArticleUpload/4710-21561-1-CE.pdf>
12. Farooq U, FM Anjum, T Zahoor, SU Rahman, MA Randhawa, A Ahmed and K Akram. 2012. Optimization of lactic acid production from cheap raw material: sugar cane molasses. Pak. J. Bot., 44(1): 333-338 (Impact Factor 0.84) [http://www.pakbs.org/pjbot/PDFs/44\(1\)/49.pdf](http://www.pakbs.org/pjbot/PDFs/44(1)/49.pdf)
13. Ahmed A, NA Malik, MA Randhawa, A Ahmad, S Akhtar, H Ahmed, SS Shah. 2012. Changes in Vegetable Oil Used for Commercial Frying: A Case Study from Rawalpindi, Pakistan. J Chem Soc Pak. 34 (5): 1079-1083 (Impact Factor 1.38) <http://jcsp.org.pk/PublishedVersion/434a7a3e-943d-4712-8b97-48633fd43ea1Manuscriptpercent20nopercent204,percent201stpercent20gallypercent20proopercent20fofpercent208876percent20Anwarpercent20Ahmed.pdf>
14. Yousaf A A, A Ahmed, A Ahmad, T Hameed, MA Randhawa, I Hayat, N Khalid. 2013. Nutritional and functional evaluation of wheat flour cookies supplemented with gram flour. International Journal of Food Science and Nutrition, 64(1):63-68 (Impact Factor 1.15) <http://www.ingentaconnect.com/content/apl/cijf/2013/00000064/00000001/art00010>
15. Ahmad Z, MS Butt, A Ahmed, M Riaz, SM Sabir, U Farooq and FU Rehman. 2012. Effect of *Aspergillus niger* xylanase on dough characteristics and bread quality attributes. Journal of Food Science and Technology DOI:10.1007/s13197-012-0734-8 (Impact Factor 0.50) <http://link.springer.com/article/10.1007percent20Fs13197-012-0734-8#>
16. Hayat I, A Ahmad, T Masud, A Ahmed. 2014. Nutritional and health perspectives of beans (*Phaseolus vulgaris* L.) – An overview. Critical reviews in Food Science and Nutrition 54:580–592. (<http://dx.doi.org/10.1080/10408398.2011.596639>) (Impact Factor 4.79) <http://www.tandfonline.com/doi/pdf/10.1080/10408398.2011.596639>
17. Khalid N, A Ahmed, MS Bhatti, MA Randhawa, A Ahmad and R Rafaqat. 2014. A question mark on zinc deficiency in 185 million people in Pakistan- possible way out. Critical Reviews in Food Science and Nutrition 54:1222–1240 (<http://dx.doi.org/10.1080/10408398.2011.630541>) (Impact Factor 4.79) <http://www.tandfonline.com/doi/pdf/10.1080/10408398.2011.630541>
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Research Grant	1. Value Addition of Selected Stone Fruits by Osmotic Dehydration and Hot Air Drying – A research project funded by HEC 4.01 Millions 2. Transfer of technology of Value Addition of Selected Stone Fruits by Osmotic Dehydration and Hot Air Drying to the farmer (US\$ 2600 AIP USAID Funded) 3. Dissemination of Developed Technology of Value Addition of Fruits from University to Farmer (US\$ 5000 AIP USAID Funded) 4. Characterization of Nutraceutical Potential of Buckwheat and Value Addition of Cereal Products – A research project funded by HEC 8.463 Millions
Research or Creative Accomplishments	<u>TECHNOLOGIES DEVELOPED AT DEPARTMENT OF FOOD TECHNOLOGY PMAS-ARID AGRICULTURE UNIVERSITY RAWALPINDI</u> <u>Degradation of insecticides in vegetables by processing and chemical solutions</u> There is wide use of insecticides on fruits and vegetable which is causing several health hazards. There are several processing operations like washing, peeling, trimming cooking etc. It was found that cooking was the most effective for reduction of the insecticide residues followed by blanching, peeling, washing and dipping in the

tap water. Treatments with acidic solutions were more effective than alkaline solutions for reduction of residues of insecticides in these vegetable. These results have implications for assessing dietary exposure limits of these insecticides

Use of additives for shelf life extension of chapatti

A study was designed with the aim to investigate the effect of different additives such as CMC (carboxy methyl cellulose), ascorbic acid, lecithin and sodium propionate on the dough and chapatti making characteristics, and also to check the staling of chapatti. The additives were added at different concentration (CMC 0.5, 0.75 and 1 percent, ascorbic acid 0.3, 0.35 and 0.4 percent, lecithin 0.5, 0.75 and 1 percent and sodium propionate 0.1, 0.2 and 0.3percent) in wheat flour and analyzed their effect on dough rheology along with baking and sensory attributes of chapattis during storage period of 24 hours. The results of the present study showed that additives improved the rheological characteristics of wheat flour as compared to control. The additives like CMC and lecithin improved the pasting property, water absorption capacity, dough development time and dough stability of wheat flour. Additives like sodium propionate and ascorbic acid along with CMC and lecithin reduced the mould growth during the storage period of 24 hours. The addition of additives improved almost all the sensory attributes as compared to the control.

Development of high protein cookies with Gram flour

Protein-energy-malnutrition is the major nutritional problem especially in infants and children. It is a need to explore and utilize cheap high protein food sources to enhance the nutritional quality of foods. Cookies were prepared by supplementing gram flour into wheat flour at levels of 0, 10, 20, 30, 40, 50percent and analyzed for chemical, physical and sensory properties. The protein quality of the cookies was also assessed by feeding gram flour supplemented cookies to Albino rats for 10 days. The gram flour was found to be higher in quality protein and amino acid profile. The supplementation resulted in significant increase in protein, fat, crude fiber and ash contents of the cookies. The thickness and spread factor of cookies differ significantly while non-significant effect was observed in width of cookies. The protein efficiency ratio (PER), net protein utilization (NPU), biological value (BV) and true digestibility (TD) differed significantly among diets containing cookies with gram flour fed to rats. The physicochemical and sensory evaluation of cookies revealed that up to 30percent substitution of Straight Grade Flour (SGF) with gram flour produced acceptable cookies as compared to control. The cookies containing 40-50 percent gram flour were best regarding protein bioavailability in rats.

Development of quality baby foods by use of various protein substitutes

Protein is important nutrient providing energy and regulatory function but

unfortunately most part of the world, protein malnutrition is a grave threat to infants. To deal this problem this study was designed to develop new baby food that can fulfill the nutrient requirements of infants. Four types of baby foods were prepared by utilizing different potential protein sources including cereals, pulses, oil seeds, potato and banana in different proportions. High protein and mineral contents were observed in all the baby foods. The protein contents ranged between 18.59 percent to 28.53 percent in these baby foods providing 408.5 to 450.5 Kcal of energy. The mean scores for color, texture, flavor, taste and overall acceptability for all the four recipes were between 6 (like slightly) and 7 (like very much) on 9-point hedonic scale. Recipe 1 containing rice, mung beans, potato, poppy seeds and banana received the highest quality scores from the panel of judges

Extension in storage of chapatti with hydrocolloids, partial baking and frozen storage technique

Use of hydrocolloids in different foods systems has been increased to improve texture and quality of baked products. Nevertheless, the effect of these compounds on partially baked frozen chapatti has not been studied. The objective of the present study was to improve the storage stability, quality and shelf life of partially baked chapatti by adding different hydrocolloids hydroxyl propyl methylcellulose (HPMC), carboxy methylcellulose (CMC) and Guar gum, during frozen storage of 28 days. Chapattis prepared from frozen dough were analyzed for chemical and sensory attributes at each 7 days interval. Rheological studies showed an increase in water absorption, dough development time and dough stability after the addition of hydrocolloids. In partially baked chapatti prepared from frozen dough an increase in moisture retention and water soluble starch was observed. Sensory characteristics are also improved by combining both the techniques. Among the hydrocolloids HPMC exhibited the best results followed by CMC and guar gum. These hydrocolloids and partial baking with frozen storage helped in improving the quality and extending the shelf life of chapatti.

Development of cookies supplemented with buckwheat flour

Malnutrition is the serious problem in developing countries causing severe health problems. In order to reduce malnutrition we can do supplementation of highly nutritious food products in cookies. Incorporation of new ingredients in cookie formulation can improve the cookies sensory qualities, nutritional values and functional properties. Buckwheat is recognized as a potential functional food. It has health promoting properties due to numerous functional compounds like crude fiber minerals, vitamins, antioxidant and protein which can serve as a better source of supplementation. Buckwheat protein contains amino acids with high biological such

	as lysine, threonine and tryptophan, antioxidants like rutin and minerals like Zn, Fe and Se. Buckwheat protein extracts may have strong healing effect to some chronic diseases, such as diabetes, hypertension, hypercholesterolemia and cardiovascular diseases. The present study aims at the preparation of cookies by supplementation of buckwheat flour. The cookies will be prepared by replacing wheat flour with 0, 10, 20, 30, 40 and 50 percent of buckwheat flour. Cookies will be analyzed for physicochemical parameters like moisture, fat, protein, fiber and mineral contents. Physical evaluation (thickness, width and spread factor) and sensory evaluation (color, flavor, taste, texture and overall acceptability) of cookies will also be carried out to determine the acceptability of buckwheat supplemented cookies. Through the supplementation of buckwheat flour nutritional value of the cookies can be improved. Hence it can serve as a best tool to eradicate malnutrition in the masses.
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Name	Dr. Asma Sohail
Personal	Designation: Assistant Professor, Department of Food Technology, PMAS Arid Agriculture University, Rwp Specialization: Food Sciences Place of Birth: Rawalpindi, Pakistan Nationality: Pakistani
Experience	12 years 3 months
Honors and Awards	2007 Win HEC foreign scholarship 2000 Gold Medal in MSc. (Hons.) Food Technology 2000-01 OPF Certificate of Merit Award 1998-99 OPF Certificate of Merit Award
Memberships	-
Academics	PhD Food Sciences The University of Queensland, Australia
Service activity	• Teaching at undergraduate and post graduate level • Supervise and assist post graduate students in their research activities • Supervise and assist PhD students • Departmental timely administrative tasks
Research Interest	Encapsulation, nutraceuticals, probiotics
Publications	International Publications • Anjum, N., S. Maqsood, T. Masud, A. Ahmad, A. Sohail, A. Momin. (2014). <i>Lactobacillus acidophilus</i> : characterization of the species and application in food production. Critical Reviews in Food Science and Nutrition, 54(9), 1241-51.(Impact factor: 4.82) • Akram, A., A. Sohail, T. Masud, A. Latif, S. Tariq, S.J. Butt, I. Hassan. (2014). Physico-chemical and antimicrobial assessment of honey of <i>Apis dorsata</i> from different geographical regions of Pakistan. International Journal of Agricultural Science Research, 3(2), 025-030. • Adeel, R., A. Sohail and T. Masud. (2014). Characterization and antibacterial study of pumpkin seed oil (<i>Cucurbita pepo</i>). Life Sciences Leaflets, 49, 53-64. • Masood, M., T. Masud, S. Tariq and A. Sohail. (2014). The effect of casein hydrolysate formed by probiotic culture on cholesterol reduction. Life Sciences Leaflets, 49, 116-127. • Tariq, S., T. Masud, S. Tariq and A. Sohail. (2014). Black seed (<i>Nigella sativa</i>) possess bioactive compounds act as anti-Helicobacter pylori agent. World Journal of Pharmaceutical Sciences, 2 (2), 203-209. (Impact factor: 1.0408). • Mahmood, T., T. Masud and A. Sohail. (2013). Some probiotic and antibacterial properties of <i>Lactobacillus acidophilus</i> cultured from dahi a native milk product. International Journal of Food Science and Nutrition. DOI: 10.3109/09637486.2014.880666 (Impact factor: 1.257).

	• Sohail, A., B. Bhandari, M.S. Turner, A. Coombes. (2012). Direct encapsulation of small molecule hydrophilic and hydrophobic actives in micron size alginate microspheres using a novel impinging aerosols method. <i>Journal of Drug Delivery Science and Technology</i>, 22, 139-143. (Impact factor: 0.679) • Sohail, A., M. S. Turner, E. K. Prabawati, A. Coombes, B. Bhandari. (2012). Evaluation of <i>Lactobacillus rhamnosus</i> GG and <i>Lactobacillus acidophilus</i> NCFM encapsulated using novel impinging aerosol method in fruit food products. <i>International Journal of Food Microbiology</i>, 157(2), 162-166. (Impact factor: 3.327). • Sohail, A., M. S. Turner, A. Coombes, B. Bhandari. (2012). The Viability of <i>Lactobacillus rhamnosus</i> GG and <i>Lactobacillus acidophilus</i> NCFM following double encapsulation in alginate and maltodextrin. <i>Food and Bioprocess Technology</i>, (In Press), DOI 10.1007/s11947-012-0938-y. (Impact factor: 3.703). • Sohail, A., M. S. Turner, A. Coombes, T. Bostrom, B. Bhandari. (2011). Survivability of probiotics encapsulated in alginate gel microbeads using a novel impinging aerosols method. <i>International Journal of Food Microbiology</i>, 145(1), 162-168. (Impact factor: 3.327). <u>National Publications :</u> • Javeria, S., T. Masud, S. Sammi, S. Tariq, A. Sohail, K. S. Abbasi and S. Ali. (2013). Comparative study for the extraction of β-carotene in different vegetables. <i>Pakistan Journal of Nutrition</i>. 12 (11): 983-989. (HEC-recognized). • Amin, A., M. Ali., Asif. A., Mahmood. U. H. (2001). Effect of coatings and polyethylene sheet on the shelf life of mangoes (<i>Mangifera indica</i> L.). <i>Pak. J. Arid Agric</i>. 4(1-2): 7-13.
Research Grant	-
Research or Creative Accomplishments	1. Microencapsulation of probiotics and pharmaceuticals in impinging aerosol method. 2. Encapsulation of pumpkin seed oil 3. Characterization and antibacterial study of pumpkin seed oil 4. Physico-chemical and antimicrobial assessment of honey of <i>Apis dorsata</i> 5. Phytochemical and antimicrobial activities of date fruit powder 6. Effects of coatings and polyethylene sheet on mangoes.

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Personal	Home Address: H-#. CB-193 G.T. Road, Munirabad, Near Rai Memorial Hospital, Wah Cantt. Mobile: 0300-5151873 E-mail: asia_latif_760@hotmail.com
Experience	<i>Lecturer (Jan. 2006 to todote)</i> Department of Food Technology, University of Arid Agriculture, Rawalpindi. • Time to time assignment by the head of department • Teaching of courses and Practical Work • Member of the supervisory committee of students • Supervisor of M.Sc. (Hons.) student <i>Visiting Lecturer (Food Technology) Fall Semester, 2005-2006</i> <i>(Sep. 22, 2005-Jan., 20, 2006)</i> Department of Food Technology, University of Arid Agriculture, Rawalpindi. • Teaching course of “Principles of Food preservation” and “Meat Technology” for the Fall Semester, 2005-2006. <i>Research Assistant (10-05-2004 to 16-05-2005)</i> Department of Food Technology, University of Arid Agriculture, Rawalpindi. • Work under HEC scholarship program “Support to Scientific Talent”. To look after the research as well as practical execution of the undergraduate students.
Academics	2014 Ph. D (Research work completed, thesis in process) 2002-2004 M.SC. (HONS.) AGRICULTURE IN FOOD TECHNOLOGY.

	University of Arid Agriculture, Rawalpindi. Result: 556/700, 79.42percent, 3.86CGPA 1st Division. Food Science and Technology; Biochemistry; Experimental Statistics; Computer Application in Statistics; Marketing Management. Quality Assurance Management, HACCP. Cereal/Baking Science, Preservation. Quality Improvement and Shelf life Extension of Bread. 1998-2002 B.SC. (HONS.) AGRICULTURE WITH MAJOR FOOD TECHNOLOGY. University of Arid Agriculture, Rawalpindi. Result: 3020/3700, 81.62percent, 3.89CGPA 1st Division. Agriculture Sciences; Food Technology; Biomathematics; Introduction to Statistics; Rural and Pastoral Sociology; Principle of Economics. Preservation and Standardization of the techniques for making Peanut Butter. 1998 HSSC. (Pre-Medical) Federal Board of Intermediate and Secondary Education, Islamabad. Result: 811/1100, 73.72percent, 1st Division. 1995 SSC. (Science) Federal Board of Intermediate and Secondary Education, Islamabad. Result: 610/850, 71.76percent, 1st Division.
Research Interest	Cereals Functional food
Publications	1. A. Latif, and T. Masud. 2006. Use of Natural Preservatives in Bread

	Making. <i>American Journal of Food Technology</i>. 1(1): 155. 2. Masud, T., T. Mahmood, A. Latif, S. Sammi and T. Hameed. 2006. Influence of processing and cooking methodologies for reduction of phytic acid content in wheat (<i>Triticum aestivum</i>) varieties. <i>Journal of Food Processing and Preservation</i>. JFPP No. 26-102 (accepted). 3. Masud, T., A. Latif and A. Zia. 2006. To stabilize the cloud formation in the orange squash by using different additives. <i>Journal of Food Processing and Preservation</i>. (Submitted on July 20, 2006). 4. N. Anjum, T. Masud and A. Latif. 2006. Effect of Various Coating materials on the keeping Quality of mangoes <i>Mangifera indica</i> stored at low temperature. <i>American Journal of Food Technology</i>. 5. S. Bashir, T. Masud and A. Latif. 2006. Effect of flaxseed (<i>Linum unitatissimum</i>) on the baking properties of cakes and cookies. <i>International Journal of Agriculture Research</i>. 6. Masud, T., A. Latif and S. Atta. 2006. Influence of different amount starter culture on the properties of yoghurt obtained from buffalo milk. <i>International J. Dairy Technol</i>. IJDT No. 0028-06 (Submitted on Sep. 21, 2006)
Research Grant	Nil