National Agriculture Education Accreditation Council

192

AIC Report

Dr. Saeed Akhtar Sheikh
Mr. Naseer Alam Khan

June 23, 2016

Department of Food Science & Technology
IAGS, University of the Punjab, Lahore

NAEAC Secretariat, Sports Block, HRD Building, HEC, H-8/1, Islamabad
Ph# 051-90802681, 051-90802680 Fax#051- 90802682
Website: www.naeac.org, Email: infonaeac@yahoo.com

Evaluation Criteria and Score

B.Sc. (Hons.) and M.Sc. (Hons.) Agriculture (Food Science & Technology)

Sr.No.	Evaluation Criteria	Score	Score Assigned
A. Major Criteria			
1	Strength and Quality of Faculty	250	170
2	Curriculum Design and Development	150	105
3	Infrastructure and Learning Resources	200	130
4	Students Support and progression	100	60
	Sub - Total (A)	**700**	**465**
B. Minor Criteria			
1	Research and Consultancy Activities	150	95
2	Governance and Leadership	100	65
3	Recent Innovations and Best practices	50	25
	Sub - Total (B)	**300**	**185**
	Grand Total (A+B)	**1000**	**650**

Dr. Saeed Akhtar
Director, institute of Food Science & Nutrition
Bahuddin Zakariya University, Multan

Name and Designation

Signature of Program Evaluator

EXECUTIVE SUMMARY

University of the Punjab Lahore is considered a premier educational institution of Punjab imparting education in a myriad of disciplines including Agricultural Sciences. In addition to several other disciplines, Institute of Agricultural Sciences (IAGS), Punjab University Lahore introduced BS program in Food Science & Technology in the year 2013. Based on the available infrastructure and strengths of the faculty, B.Sc. (Hons.), Food Science and Technology was previously accredited by National Agriculture Education Accreditation Counsel (NAEAC) in 'Y' category in the year 2013. Consequently, 14 students of B.Sc. (Hons.) Agriculture majoring in Food Science and Technology graduated from this institute as a 1st session in the year 2015.

As far as teaching faculty in the discipline of Food Science and Technology is concerned, nine of the faculty members were found working as visiting lecturers with two of them on contract and IPFP basis and three permanent/ regular teachers. There is no Associate Professor or Professor level faculty available in the discipline at present which contradicts with NAEAC policy entailing recruitment of one Professors, One Associate Professor, Two Assistant Professors and Four Lecturers.

Since the institute has been offering degrees in many fields of Agriculture therefore each discipline requires a reasonable number of labs, class rooms and offices to meet fundamental infrastructural needs of the respective discipline. Current premises of the institute hardly meets such requirements of these disciplines especially of Food Science and Technology. However, available class rooms are furnished with multimedia, projector, good seating arrangements and white board facilities. Although, another block of the institute is under construction which might suffice the needs for space in future for the discipline of Food Science and Technology but the institute must consider meeting such requirements on urgent basis as well.

On the analogy of several other institutions offering degrees in Food Science and Technology, the Institute has been following curricula for BSc. Program that is periodically designed by national experts in the relevant discipline and approved by HEC Islamabad.

The laboratories and food processing hall are well equipped with the requisite instruments/ equipment and tools; however there is still a room for improvement for strengthening these labs. Sufficient learning resources, students' counseling and support were found in place. Ample number of books in the library alongside good health care facilities, IT, sports and transport facilities are available to the students in the institute.

Keeping in view the status of existing faculty and availability of infrastructure including labs., class rooms, faculty offices as well as IT facility, the AIC assigns score of 65 percent thereby placing this program in category 'X3' as per scheme provided by NAEAC against which the program qualifies for accreditation of the Food Science degree program however there is still a lot of room for improvement in the program.

CRITERION WISE ANALYSIS

Strength and quality of Faculty

Amongst fourteen faculty members who are currently performing teaching and research activities in the institute, only three member have been noticed to be working on permanent/ regular basis whilst the remaining staff was appointed either on contract/ visiting basis or on IPFP. This state of affairs indicates a sheer shortage of the faculty to meet the very basic requirement for accreditation of a program in the light of the policy of NAEAC. Food Science degree program comprises fourteen faculty members out of which three are permanent and two are on contract and nine faculty members are working on part time basis. It was further witnessed that the institute has been offering M.Sc.(Hons.) in Food Science and Technology , therefore it becomes imperative for the management to meet this deficiency that may otherwise hamper the institute to be accredited for graduate and post graduate degree programs in Food Science and Technology in the days to come. Furthermore, there is a dire need of senior faculty at the rank of Associate Professor and Professor and also meeting the requirement of appointing/ recruiting permanent faculty staff for the efficient execution of the program is imperative.

Current faculty has been found to be actively involved in research and teaching activities in addition to writing research projects and research papers with organizing conferences and seminars in the institute. Moreover, many teachers have been shown to work enthusiastically for strengthening the BS and MS programs through collaboration and industry academia collaboration. Faculty is fully satisfied with their teaching assignments and research activities. Teachers actively take part in field and study tour programs pertaining to the subjects of their interest. With a view point to develop the faculty, the opportunities are lacking for foreign training of the faculty in terms of offering post Doc facilities. However, the faculty must try to hunt such opportunities at global level to proceed for Post Doc.

Curriculum Design and Development

Most of the institutes offering BS and MS in Food Science and Technology have been following the well-defined and organized curriculum properly designed by HEC with the help of national and international experts of the respective discipline. The Institute has been following the similar curriculum with a little change /modification in a few courses that does not influence the overall impact of the curriculum. It is momentous to mention that strict compliance to HEC designed curriculum is not mandatory and the institutes/ departments may take a little liberty to modify the curriculum to some extent keeping in view the regional needs, local culture, type of produce and the kind of available industry. Institute of Agricultural Sciences at Punjab University is primarily located in the hub of Food Industry and there is a lot of opportunities for the institute to get connected with the technical personnel of the industry to understand the needs of the industry which might be incorporated in the existing curriculum to train the students and to develop the specific skills in them to meet the said requirements of the industry.

.

Infrastructure and Learning Resources

Institute of Agricultural Sciences seems to be good in terms of infrastructural aspects as most of the faculty members have been provided with ample office space along with computer and internet facilities. Available labs, well equipped with state of the art equipment and the space allocated to these labs sound to be sufficient enough to perform basic research and practicals at undergrad and postgrad level. Independent air conditioned departmental library was found to contain a significant number of books on agricultural science and a section on food technology had been allocated for the students of Food Science and Technology. Library has subscription of different foreign and local journals related to the field. Main library of the university has more than 100 field related titled books and subscription to many journals through HEC digital library portal.

There are eight classrooms for under and post graduate students which are obviously less in numbers and the management may plan to increase the number of class rooms and offices for staff and faculty in future.

Students Support and Progression

All the students at Institute of Agricultural Sciences were seen much satisfied as far as students' guidance, counseling and orientation are concerned. Students are provided with ample opportunities to visit local food industry to broaden their practical vision about the subject. Sufficient number of scholarships is also available for the students of Food Sciences at University level. Similarly, the Institute has provided the basic computing facilities to students, having free access to institutional computer lab. Around 25 computers are available to facilitate the students of Food Sciences. The institute has its own spacious digital library having seating capacity for 75 students. Scientific journals and e-books are also available to download from internet for teachers and students. Punjab University currently has 29 hostels for the accommodation of the students and highly functional sports department that organizes annual sports events at university and inter-university levels. The health center established in the campus provides emergency and OPD facilities to the students. Services for general medical care and specialties of ENT, eye, dental, pathological examination and radiology labs are available. The University has also well-established transport system for students/staff and faculty for daily pick and drop.

SWOT Analysis

Strength

- Faculty of 14 members with three regular teachers mostly of lecturer and assistant professor level.

Weaknesses

- Majority of the faculty is serving either on contract basis or part time basis.
- Lack of senior and highly experienced teaching faculty.
- Shortage of Lab equipment for advanced research in certain specialized areas of food science especially cereals, meat and dairy technology.

- Available budget insufficient to meet the minimum requirements for laboratories and research.
- Pilot-scale food processing plants for student's orientation and training is not in place.

Opportunities

- The skilled human resource can meet the local needs for food industry.
- Exclusive expertise is available in the institute for capacity building/ training of the professionals and industrialists in the region.
- Better employment opportunities with competitive salary packages for the students graduating in Food Science and Technology.

Threats

- More senior faculty is required for the quality education in degree program.
- Acute shortage of residential facilities for faculty at campus due to which working efficiency is suffering.
- Shortage of supporting lab staff.
- Independent allocation of sufficient budget for recurring needs and development projects.
- More space is needed.

Actionable Recommendations

- Appointment of senior faculty including Professor and Associate Professor.
- Strengthening of labs and class rooms to meet modern day requirements for research and teaching.
- Industry/ academia collaboration to attract more funds for the institute and to help food industry resolve their technical issues.
- Allocation of sufficient separate budget for the discipline of Food Science.
- Faculty development program be launched.
- Periodical organization of conferences and seminars to attract the stakeholders to focus the discipline of Food Science.
- Writing more research projects to win grants at national and international level.

Final Recommendation

Keeping in view the status of existing faculty and availability of good infrastructure including class rooms, faculty offices and IT facility the AIC assigns a score of 65 percent to this program thereby placing it in category of 'X3' which qualifies for accreditation of B.Sc. (Hons) and M.Sc. (Hons) Agriculture (Food Science) with the NAEAC/HEC.

Annexure-I

Profile of Faculty Members

Sr. No.	Name of Faculty Member	Designation	Status of Appointment (Regular/ Contract)	Experience	Specialization
1.	Dr. Shinawar Waseem Ali	Assistant Professor	Regular (TTS)	5.5 Years	Food Safety and Toxicology
2.	Dr. Nasir Ahmad	Assistant Professor	Regular (TTS)	5 Years	Food Analysis and Biotechnology
3.	Dr. Zaheer Hussain	Assistant Professor	Contractual	03 years	Meat and Dairy Technology
4.	Dr. Aftab Ahmad	Assistant Professor	IPFP	01 years	Food & Nutrition
5.	Dr. Maliha Uroos	Assistant Professor	Regular (Chem.)	03 years	Food Chemistry

Annexure-II

List of Labs and Lab Equipment available

Lab No. 01-- Food Technology Lab

Sr. No.	Name of Instrument	Qty.	Status	Condition	Company	Model No.
1.	-20 C Freezer	1	IAGS	Working	Teka	TGF 270
2.	Refrigerator	1	IAGS	Working	Teka	TSI 370
3.	Steamer	1	IAGS	Not Working	Local	N.S. Engineering
4.	Drying Oven	1	IAGS	Working	N.S. Engineering	
5.	Chiller	2	IAGS	Working	N.S. Engineering	
6.	Aloe Vera processing unit With Vacuum Pump	1	IAGS	Working	Local	
7.	Oil Press Unit	1	IAGS	Working	Local	
8.	Extraction Oil Unit (Essential) (Big)	1	IAGS	Not Working	N.S. Engineering	
9.	Essential Oil Unit (Extraction) (Small)	1	IAGS	Working	N.S. Engineering	
10.	Scale Balance	1	IAGS	Working	Eagle	S-16
11.	Beam Balance (Kg)	1	IAGS	Working	Local	
12.	Sohxlet Apparatus with accessories	1	IAGS	Working	L.N.S.	
13.	Distillation Unit	1	IAGS	Working	Noor Max	
14.	Pulper	1	IAGS	Working		
15.	Muffle Furner	1	IAGS	Working	Local	

Lab No. 02-- Food Safety & Nutrition Lab

Sr. No.	Name of Instrument	Qty.	Status	Condition	Company	Model No.
1.	Refrigerator	1	Project	Functional	Mitsubishi	
2.	Laminar Flow Hood	1	IAGS	Functional	NUAIRE	
3.	Computer	1	IAGS	Functional		
4.	Spectophotometer	1	IAGS	Functional		

5.	Freeze Draying	1	IAGS	Functional		
6.	Static Incubator	1	IAGS	Functional		
7.	Steroscope	1	IAGS	Functional		
8.	Microscopes	2	IAGS	Functional		
9.	Water Bath	1	IAGS	Functional		
10	TLC	1	IAGS	Functional		

Lab No. 03-- Food Analysis Lab

Sr. No.	Name of Instrument	Qty.	Status	Condition	Company	Model No.
1.	Analytical balance (Sartorius, Germany	1	Project	Functional		GE 212
2.	Hot Plate and Magnetic Stirrer	1	IAGS	Functional		
3.	pH meter	1	IAGS	Functional	MARTINI, USA	MY 12203
4.	Drying Oven (Local)	1	IAGS	Functional		
5.	Water Bath (china)	1	IAGS	Functional		
6.	Soxhlet apparatus with accessories	1	IAGS	Functional		
7.	Micro-kjeldahl digestion and distillation assembly	1	IAGS	Functional		
8.	Muffle furnace	1	IAGS	Functional		
9.	Tirtation Assembly	1	IAGS	Functional	Pyrex	
10.	Flame Photometer	2	IAGS	Functional		

Lab No. 04-- Food Microbiology & Biotechnology Lab

Sr. No.	Name of Instrument	Qty.	Status	Condition	Company	Model No.
1.	Laminar Flow hood	1+1	IAGS	Working	Scientific Corporation Bio Base	BBS-V680
2.	Refrigerator	2+1	IAGS	Working	Mitsubishi LG Dawlance	

3.	Plant Growth Chamber	1	IAGS	Working	Wisd	
4.	Hot Plate and Magnetic Stirrer	1	IAGS	Working	Wisd	MSH-20A
5.	Analytical Balance	1	IAGS	Working	Sartorious	HCB 602H
6.	Microscope	1	IAGS	Working	Labomed	
7.	Stereo Microscope	1	IAGS	Working	Labomed	
8.	Liquid Nitrogen Container Thermo	1	IAGS	Working	Theromo Scientific	
9.	pH meter	1	IAGS	Working	Jenway	3505
10.	Dry Oven	1	Project	Working		
11.	PCR Machine	1	Project	Working	ICCC	PTC-06
12.	Gel Electrophoreses	1	Project	Working	ICCC	250
13.	SDS PAGE	1	Project	Working	Cleaver	
14.	Shaking Incubator Mini	1	Project	Working	Wisd	

Annexure-III

List of Recommended Text Books

Sr.#	Authors Name	Title
1	Taylor Steve L.	Advances in Food and Nutrition Research
2	Khachatourians, George G, Arora, D	Applied mycology and biotechnology
3	NISTE	Appllied Physics & Food Physics
4	Sabarwal,Bhavana	Dictionary of Food and Nutrition
5	Vieira,Ernest R	Elementary Food Science
6	Awan, J.A.	Elements of Food Science & Technology
7	Law, Barry A., Whitehurst, Robert J.	Enzymes in Food Technology
8	Hafiz, A, Afzal, M.	Farming and Food in the Third World
9	Hafiz, A, Afzal, M.	Farming and Food in the Third World
10	James Jhon M, Burks Wesley	Food Allergy
11	Hui, Y. H., Nip, Wai-Kit	Food Biochemistry and Food Processing
12	Paliyth, Gopinadhan, [et.el], Shetty,	Food Biotechnology
13	Chopra, H.K	Food Chemistry
14	NISTE	Food Engineering Operation & Principle
15	NISTE	Food Engineering, Operations & Principles
16	Cheng Ling Min	Food Machinery
17	Doyle, Michael P., Beuchat, Larry R.	Food Microbiology
18	NISTE	Food Microbiology FPT-132
19	Chanda,Rati, Sagar	Food And Nutrition
20	Spencer, John F.T, Spencer, Alica L.	Food Microbiology Protocols
21	Lawson Harry	Food Oils and Fats
22	Sunlee Dong	Food Packaging Science nad Technology
23	Triveni,Parkash	Food Preservation
24	Awan, Javaid Aziz, Rehman, Salim-u	Food Preservation Manual
25	Shafiur Rahman	Food Properties Handbook
26	Mothes,R, Schwenke, K.D	Food Proteins Structure and Functionality
27	Wallace Carol A.	Food Safety for the 21st century
28	Potter, Norman N,, Hotchkiss, Josep	Food Science
29	Mahindru, S.N	Food Science & Technology (set in 7 Volumes)
30	Devi, Nithya,M.	Food Science And Technology
31	McClure, Peter J.,	Blackburn, Clive d Foodborne Pathogens
32	Riaz N, Munir M	Halal Food Production
33	NISTE	Industrial Methods of Food Preservation
34	Steinkraus, Keith H.	Industrialization Of Indigenous Fermented Foods
35	Asif, Muhammad	Introduction to Food Science
36	Shibamoto Takayuki, Bjeldanes Leo	Introduction to Food Toxicology

37	Karanth, Apoorva	Plant Genetics & Food Crop Science
38	Henry, Robert	Plant Resources For Food, Fuel and Conservation
39	Gobran, George R., Wenzel, Walter	Trace Elements in the Rhizosphere
40	Allen, D. J., Lenne, J. M.	The Pathology of Food and Pasture Legumes
41	Parthasarathi .M	Crop Nutrition
42	Chang, Shu-Ting, Miles, Philp G.	Mushrooms
43	Brown Judith E	Nutrition
44	Eastwood, Martin	Principles of Human Nutrition
45	Rolfes Sharon rady, Pinna Kathrny N	Understanding Normal and Clinical Nutrition
46	Pokorny, Jan, Yanishlieva, Nedyalka	Antioxidants in food
47	Xiao, L, Ryan,U, Feng,Y	Biology of Foodborne Parasites
48	Garti, N.	Delivery and Controlled release of Bioactives in foods In
49	Der Kamp, Jan Willem Van, Jones, J	Dietary Fibre: New Frontiers for Food and Health
50	Sonesson, U., Berlin, J, et al	Environmental assessment and management in the food In
51	Dijksterhuis, Jan, Samson, Robert A.	Food mycology
52	Riar, C.S	Food Grain Product Technology and Quality Characteristic
53	Bogh-Sorensen, Zeuthen, Peter	Food Preservation Techniques
54	Campbell-platt, Geoffrey	Food Science and Technology
55	Hua, T. , Liu, B., Zhang, H.	Freeze-drying of pharmaceutical and food products
56	Toledo, R. T	Fundamentals of Food Process Engineering
57	Misra, J.K, Lichtwardt, Robert W.	Illustrated Genera Of Trichomycetes
58	Jaiswal, Prem Kumar	High-performance Thin-Layer Chromatography in Food An
59	Sheaffer, Craig C.	Introducion to Agronimy Food, Crops, and Environment
60	Samson, Robert A., Hoekstra, Ellen	Introduction to Food and Airborne Fungi
61	Droby, Samir, Wilson, Charles	Microbial Food Contamination
62	Modi, H. A.	Microbial Spolage of Foods
63	Liu, Dongyou	Molecular Detection of Foodborne Pathogens
64	Magan, N., Olsen, M.	Mycotoxins in Food
65	Decker, Eric A., Elias, Ryan J., [et.el]	Oxidation in Food and Beverages and antioxidant Application
66	Guha, B.	Crop Nutrition
67	Parthasarathi, M.	Crop Nutrition
68	Goyal, P.	Nutrition of Fruit Trees
69	Cousins, John, Foskett, David, [et.el]	Food and Beverage Management
70	Knechtges, P. L.	Food Safety
71		Food Safety and Pesticides

72	D Souza, J, Pradhan, J	Handbook of Food Processing, Packaging and Labeling
73	Chakraborty, A	Pesticides in Foods
74	Parthasarathi, M.	Crop Nutrition
75	Porter, J. R, Lawlor, D. W.	Plant Growth Interactions With Nutrition and Environment
76	Javaid, Arshad	Beneficial microorganisms for mungbean production
77	Umeera, Aysha	Nutritional, Phytochemical & Pharmacological Potential of N

Annexure-IV

List of Research Publications by the Faculty

Ph.D. Faculty Research Publications during 2014-15 and 2015-16 for each faculty member.

Dr. Shinawar Waseem Ali

1. **Shinawar Waseem Ali,** Asad Nawaz, Sana Irshad, Aftab Ahmed Khan. Potato waste management in Pakistan's perspective. *Journal of Hygienic Engineering and Design,* 13 (2015) 100-107.
2. Asad Nawaz, **Shinawar Waseem Ali,** Muhammad Riaz, Zulfiqar Ahmad. Comparison of the quality of fruit juices being sold in local markets of Lahore, Pakistan. *Journal of Hygienic Engineering and Design,* 13 (2015), pp. 35-39.
3. **Shinawar Waseem Ali** and Sohaib Afzaal. Aflatoxins in Pakistani Foods: A Serious Threat to Food Safety. *Journal of Hygienic Engineering and Design*. 9 (2014) 20-25.
4. Fang-Bo Yu, Xiao-Dan Li, **Shinawar Waseem Ali**, Sheng-Dao Shan, Lin-Ping Luo, Li-Bo Guan. Further characterization of o-nitrobenzaldehyde degrading bacterium *Pseudomonas* sp. ONBA-17 and deduction on its metabolic pathway. *Brazilian Journal of Microbiology,* 45 (2014) 1303-1308
5. Hina Shanakht, Ahmad Ali Shahid and **Shinawar Waseem Ali**. Characterization of Fungal Microbiota on Rice Grains From Local Markets of Lahore. *Journal of Hygienic Engineering and Design*. 9 (2014) 35-40.
6. Amir Ismail, Muhammad Riaz, Saeed Akhtar, Tariq Ismail, Zulfiqar Ahmad and **Shianawar Waseem Ali**. Improvement of Quality Attributes of Bread by the Application of Phytases from an Indigenous Strain. *Pakistan Journal of Agricultural Sciences,* 51 (2014) 709-716. (Impact factor: 1.24)
7. Fang-Bo Yu, Xiao-Dan Li, **Shinawar Waseem Ali**, Cheng-Fang Song, Sheng-Dao Shan and Lin-Ping Luo. Use of Biogas Slurry for Enhancing Control of Phytopathogens. *Polish Journal of Environmental Studies*. 23 (2014) 533-540. (Impact factor: 0.6)

Dr. Nasir Ahmad

1. Ahmad, N., Mehboob, S. and Rashid, N. (2015). Starch-processing enzymes–emphasis on thermostable 4-α-glucanotransferases. Biologia, 70(6): 709-725. (Impact Factor 0.827)
2. Naz, S., Javaid, A., Ahmad, N., and Shoaib, A..(2014). Antibacterial activity of essential oils of trachyspermum ammi (L.) sprague and ocimum basilicum L. against acidovorax sp. Intl. J. of Biol. and Biotechnol., 11(4): 671-675. (HEC's Z category Journal)
3. Ahmad, N., Rashid, N., Haider, M. S. and Akhtar, M. (2013). Single Step Liquefaction and Saccharification of Corn Starch Using an Acidophilic, -Calcium Independent and Hyperthermophilic Pullulanase. (United States Patent Pub. No. US 2014/0227744 A1 published on 14/08/2014).

Dr. Aftab Ahmad Khan

1. Aftab Ahmed, Muhammad Umair Arshad, Shinawar Waseem Ali and Farhan Saeed.(2015).Nutritional and chemical profiling of date (Phoenix dactylifera L.) pit drink prepared from date varieties belonging to three different agro-climatic zones. Journal of Food processing and preservation. (Accepted for publication).

2. Aftab Ahmed, Muhammad Umair Arshad, Farhan Saeed, Rabia Shabir Ahmed and Shahzad Ali Shahid Chatha. (2016). Nutritional Probing and HPLC Profiling of Roasted Date Pit Powder. Pakistan Journal of Nutrition. 15 (3): 229-237.

Dr. Maliha Uroos

1. Anwar, A. Hameed, A.; Perveen, S.; Uroos, M.; Choudhary, M. I.; Basha, F. Z. "1,1-Diphenyl-2-picryl hydrazyl radical scavenging activity of novel dihydropyridine derivatives" *Eur. J. Chem.*, 2014, 5 (1), 990-992. *(Impact factor: 0.64)*
2. Magnus D.; Heine, H.; A.; Wriglesworth, A.; Uroos, M.; Calladine, J.; Murphy, T.; Hamilton, M.; Clark, I.; Greetham, G.; Towrie M.; Dowden, J.; Besley, N and George, M. "Calculating Singlet Excited States: Comparison with Fast Time-resolved Infrared Spectroscopy of coumarins" (Manuscript accepted for *Journal of Chemical Physics, 2015, impact factor: 3.12*)
3. Uroos, M.; Bhatti, H.; Uddin, N.; Ayub, K.; Saima, B.; Iqbal, J.; Anjum, S.; Light, M.; Hameed, A.; 1 and Khan, K.; *"Synthesis, characterization of flavone, isoflavone, and 2,3-dihydrobenzofuran-3-carboxylate and density functional theory studies" Eur. J. Chem.*, 2015, 6 (3), 305-313. *(Impact factor: 0.785)*