Viewpoint

Fats and oils training: an AOCS survey

Twenty-one of 45 colleges and universities that responded to an AOCS Educational Survey offer advanced degrees in fields such as food science or chemistry with specializations in fats and oils technology, lipid chemistry or lipid biochemistry (Table I). Other institutions offer fats and oils or lipids courses on a more limited basis (Table II).

In the United States, some of the more extensive fats and oils programs offered include those at the University of California at Davis, the University of Illinois, Michigan State University, the University of Minnesota, Rutgers University and Washington State University. The University of British Columbia in Canada also has a well-developed fats and oils program.

Two of the European institutions which participated in the survey offer comprehensive fats and oils programs: the Instituto de la Grasa y Sus Derivados in Seville, Spain,

Continued on page 392A.

TABLE I

Institutions awarding M.S. or Ph.D. degrees in food science or other major areas with specializations in fats and oils technology, lipid chemistry and lipid biochemistry

	Fats and oils technology		Lipid chemistry		Lipid biochemistry	
	M.S.	Ph.D.	M.S.	Ph.D.	M.S.	Ph.D.
University of Alberta Edmonton, Alberta, Canada	+	-	+	+	+	+
University of British Columbia Vancouver, B.C.	+	+	+	+	+	+
University of California Davis, CA	+	-	+	+	+	+
Clemson University Clemson, SC	-	-	-	-	+	+
Cornell University Ithaca, NY	-	-	+	+	+	+
L'Ecole Superieure d'Application des Corps Gras Paris, France	+	-	+	-	+	-
University of Georgia Athens, GA	-	-	+	+	+	+
University of Guelph Guelph, Ontario, Canada	+	+	+	+	-	-
University of Illinois Urbana, IL	+	+	+	+	+	+
Instituto de la Grasa y Sus Derivados Sevilla, Spain	+	+	+	+	+	+
Université de Laval Quebec, Canada	-	-	-	-	+	+
University of Manitoba Winnipeg, Manitoba, Canada	-	-	+	-	+	-
University of Maryland College Park, MD	+	-	+	+	+	+
Michigan State University East Lansing, MI	+	+	+	+	+	+
University of Minnesota St. Paul, MN	-	-	+	+	+	+
University of Missouri Columbia, MO	-	-	+	+	-	-
University of Rhode Island Kingston, RI	-	-	+	+	-	-
Rutgers University New Brunswick, NJ	+	+	+	+	+	+
University of Tennessee Knoxville, TN	+	-	-	-	-	-
Washington State University Pullman, WA	+	+	+	+	+	+
University of Western Ontario London, Canada	-	-	-	-	-	-

TABLE II

Number of courses and lab hours offered in the areas of fats and oils technology, lipid chemistry and lipid biochemistry

	Fats and oils technology		Lipid chemistry		Lipid biochemistry	
	No. of courses	Lab hours/week	No. of courses	Lab hours/week	No. of courses	Lab hours/week
University of Alberta Edmonton, Alberta, Canada	0	0	1	3	0	0
University of Arizona Tucson, AZ	2	0	1	0	1	0
University of Arkansas Fayetteville, AR	1	0	0	0	0	0
Brigham Young University Provo, UT	0	0	1	0	0	0
University of British Columbia, Vancouver, B.C., Canada	0	0	2	2	0	0
University of California, Davis, CA[a]	0	0	2	0	2	3-36
Clemson University Clemson, SC	0	0	0	0	1	0
Cornell University, Ithaca, NY	0	0	1	0	1	0
L'Ecole Superieure d'Application des Corps Gras, Paris, France	3	40	3	60	1	0
University of Florida Gainesville, FL	0	0	3	7	0	0
University of Georgia Athens, GA	0	0	1	3	0	0
University of Guelph Guelph, Ontario, Canada	1	3	1	3	0	0
University of Idaho Moscow, ID	0	0	0	0	1	0
University of Illinois Urbana, IL	1	0	1	6	1	0
Instituto de la Grasa y Sus Derividos Sevilla, Spain	2	40	1	30	0	0
Iowa State University Ames, IA	0	0	1	0	1	0
University of Kentucky Lexington, KY[a]	0	0	0	0	0	0
Universite de Laval Quebec, Canada	1	3	0	0	2	6
Louisiana State University Baton Rouge, LA	0	0	0	0	1	0
University of Manitoba Winnipeg, Manitoba, Canada	0	0	2	6	1	0
University of Maryland College Park, MD	0	0	0	0	2	6
University of Massachusetts Amherst, MA	0	0	1	2	0	0
Michigan State University East Lansing, MI	2	3	2	2	3	0
University of Minnesota St. Paul, MN	1	3	1	0	1	0
University of Missouri Columbia, MO[a]	0	0	2	8	0	0
University of Nebraska Lincoln, NE[a]	1	0	0	0	1	0
The Ohio State University Columbus, OH[a]	1	0	1	0	0	0
Oregon State University Corvallis, OR	0	0	1	1	0	0
Purdue University Lafayette, IN	1	0	0	0	0	0
University of Rhode Island Kingston, RI[a]	0	0	3	12	0	0
Rutgers University New Brunswick, NJ	2	0	2	0	0	0
University of Tennessee Knoxville, TN	2	4	0	0	0	0
Texas Tech University Lubbock, TX	0	0	1	0	0	0
Agricultural University of Wageningen The Netherlands	0	0	2	28	0	0
Washington State University Pullman, WA	2	6	2	3	1	0
University of Western Ontario London, Canada	0	0	0	0	2	0

[a]Additional food processing and/or food chemistry courses offered by the institution include a partial study of fats and oils technology, lipid chemistry and/or lipid biochemistry.

Continued on page 396A.

and l'Ecole Superieure d'Application Des Corps Gras in Paris, France.

This 1979/1980 educational survey updates a similar study done in 1976 and published in JAOCS in May 1977. The latest survey was directed by Dr. Sharon L. Melton of the AOCS Education Committee and is intended to provide information to students interested in graduate training in fats and oils or lipids. Students and others seeking further information should address inquiries to the institutions in which they are interested. The names of survey participants are listed on page 400A.

After survey results were compiled, JAOCS asked university and industry representatives for comments on the availability of fats and oils training in the U.S. Their responses cover a gamut of topics ranging from industry/university interaction, or the lack of it, to whether on-the-job training can substitute for university fats and oils training.

Dr. R.G. Krishnamurthy, senior group leader at Kraft, Inc., said the lack of interaction between university and industrial representatives is creating graduates who may not be fully prepared for industry jobs and lack a proper perception of industrial research. The problem is heightened by some academic research which is misleading and irrelevant, he added.

"Because of the lack of perception on the part of the student, the industry has to spend a lot of money to make them fit in the groove," Krishnamurthy said. One way of increasing the interaction between industry and academia would be to invite industrial researchers to speak to university classes, he said.

"But a major segment of university people don't seem to understand and appreciate that point of view," he said.

Dr. Rex Sims, a research scientist with General Foods Corp., agreed there is not enough exchange between universities and industries.

"I don't think most professors in the country have a good idea of what the food industry is all about," Sims said. As a result, "most people that come fresh out of school and into industry seem to be rather naive," he added.

"Many of them come to industry with the idea that they're going to do highly theoretical work and publish papers," he explained, adding that in industry, the name of the game is to make money, which often requires researchers to work primarily on product-related projects.

Although Sims said that the extent of university training in fats and oils was limited, he added that specific training in the field is not always necessary. Sims said he preferred hiring a person with a degree in organic chemistry or biochemistry rather than a person with a degree in food science. Although the food science training at some universities is very good, he said, the technology frequently can be learned on the job.

Melton:

"Students don't have any idea what goes on in a fats and oils processing plant."

Perkins:

Training for a specific industry is "something they (students) have to learn on the job."

Dr. Sharon L. Melton, associate professor at the University of Tennessee Department of Food Technology and Science, has tried to encourage the exchange between industry and academia by offering plant trips to students enrolled in her fats and oils processing course.

"Most of these students don't have any idea what goes on in a fats and oils processing plant," she said, adding that the trips have proven to be quite successful.

Melton acknowledged the limited availability of university training in fats and oils and said that the University of Tennessee needs another advanced level course, in addition to the course she teaches, which trains students with strong chemistry backgrounds in fats and oils.

Dr. Edward G. Perkins, professor of food chemistry at the University of Illinois, said University of Illinois food science students are well prepared for industry jobs because they study a broad base of courses. Students cannot be trained for a specific industry or product, such as margarine, Perkins said.

"That's something they have to learn on the job," he explained.

In addition, how well prepared students are directly relates to the quality of the institution, he said, which ultimately is reflected by the quality of the faculty.

"All of our programs at the U of I are ranked third or fourth, and I assume ours (Food Science) is also," he said.

Hasman:

"I don't think, at least from the industrial side, students are adequately prepared for research."

John M. Hasman, fats and oils section leader for CPC International-Best Foods, said that although entry-level researchers usually have a good groundwork in the basic sciences, they often are inadequately prepared for industrial applications of research. As a result, a company must spend from six to twelve months training entry-level employees.

Dr. Bernard F. Szuhaj, fats and oils research director at Central Soya Co. Inc., said few universities are geared to the practical application of fats and oils technology. Thus, when hiring entry-level research chemists, Central Soya

Continued on page 400A.

Szuhaj:

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recruiters look for persons with a basic foundation in chemistry and biochemistry, he said. A student's practical experience related to lipid chemistry in research programs or independent study is another factor considered prior to hiring, he said. Of increasing importance is a student's ability to communicate and translate his research findings for research management, he said.

Concerning the need for an exchange between industries and universities, Szuhaj said Central Soya interacts with a number of universities, notably those with faculty who are members of AOCS. But overall, he said, there is limited

Applewhite:

If universities can give students a good foundation in chemistry and physics, "then the technology could be handled by industry."

exchange between universities and industries.

Dr. Thomas H. Applewhite, director of research services at Kraft, Inc., said a good foundation in the basic principles of chemistry and physics should adequately prepare students for industrial work. In fact, many times on-the-job training is preferred over the sometimes inapplicable fats and oils training offered by universities, he said.

"If they (universities) are going to spend the time to teach a course in fats and oils, then I'd rather see them spend time on the basic chemistry and food technology principles, and we can teach them processing," he said.

Applewhite said he supports the idea of interaction between university and industry representatives, adding that AOCS currently provides for much of this exchange.

But whether enough fats and oils programs are available in the U.S. is a question which both industry and academia must continue to assess. Dr. Stephen S. Chang, professor and chairman of the Food Science Department at Rutgers University best summed up the interests of both in a JAOCS interview last year.

"Firms tell me they have to spend a year or two training chemistry graduates to be fats and oils chemists," he said, and then asked, "Where in the U.S. can a student get practical fats and oils chemistry training? There aren't too many places." □

University food science administrators participating in the survey

D.C. Paradis
Dept. of Food Science
University of Alberta
Edmonton, Alberta, Canada

Darrel E. Goll
Dept. of Nutrition & Food Science
University of Arizona
Tucson, AZ

Harry E. Snyder
Dept. of Horticultural Food Science
University of Arkansas
Fayetteville, AR

Clayton S. Huber, Chairman
Dept. of Food Science & Nutrition
Brigham Young University
Provo, UT

William Powrie, Chairman
Dept. of Food Science
University of British Columbia
Vancouver, B.C., Canada

B.S. Schweigert, Chairman
Dept. of Food Science & Technology
University of California
Davis, CA

T.M. Lukes, Head
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California State Polytechnic Institute
San Luis Obispo, CA

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Clemson University
Clemson, SC

John E. Kinsella, Chairman
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Continued on page 401A.

Viewpoint