

Collection Policy: FOOD SCIENCE

[Subject Scope](#) | [Priority Tables](#) | [Other policies . . .](#)

1.0 TEACHING, RESEARCH AND EXTENSION PROGRAMS

1.1 Mission and emphases of the department

Food Science activity at Cornell, including undergraduate instruction, graduate work through the PhD level, extension work, and faculty research, are coordinated by the Institute of Food Science. Food science research and instruction take place in the Department of Food Science at Ithaca, the Department of Food Science and Technology at Geneva, and in a variety of Cornell departments, including: Agricultural and Biological Engineering, Fruit and Vegetable Science, Nutrition, Chemical Engineering, Hotel Administration, Pharmacology, and Agricultural Economics. Faculty research, which is described in detail in a departmental brochure on file in the collection development office, covers the full scope of activity associated with food science.

1.2 Faculty research

45 faculty are affiliated with the Institute of Food Science. The emphasis of the Food Science and Technology department in Geneva is on research in fruit and vegetable processing, and enology, with emphasis on products grown in New York State. The largely complementary emphasis in Ithaca is on research and instruction in dairy products and in all other aspects of food science, domestic and international. Both departments have active extension programs.

1.3 Graduate program

The graduate field of Food Science and Technology is one of the largest in the College of Agriculture, with about 85 students, 60% of whom are foreign. Seven areas of concentration are offered within the major:

1. Food Science (general)
2. Food Chemistry
3. Food Microbiology
4. Food Engineering
5. Dairy Science
6. Food Processing Waste Technology
7. International Food Science
8. Sensory Evaluation.

In addition to the M.S. and PhD research degrees, two professional masters programs are offered. A joint CALS/College of Engineering M.Eng. in food process engineering is under development.

1.4 Undergraduate program

The department has 50 undergraduate majors. A concerted effort is underway to attract more undergraduate majors into this field, as the job opportunities are relatively plentiful.

1.5 Extension activity

Total extension effort is 5.2 FTE working on food science issues in N.Y.S. Following are selected extension activities: providing technical assistance to the dairy and food manufacturing industries; holding workshops, etc. for food industry personnel; conducting training for staff of regulatory agencies; suggesting energy conservation and waste reduction strategies to producers and distributors; communicating current manufacturing and technical problems to research staff; conducting food safety training programs for extension and other constituents; and serving as liaison between the department and the food industry.

1.6 Noteworthy facilities (e.g. unique classrooms, laboratories, farms, etc.)

Food Processing and Development Laboratory: a 31,000 sq. ft. laboratory/pilot plant for new product development, teaching and research. One program helps small companies develop new products.

2.0 SUBJECT DESCRIPTION AND GUIDELINES

2.1 Subject definition

Food technology is the application of the principles and facts of science, engineering, and mathematics to the processing, preservation, storage, and utilization of foods. Food science deals with the acquisition of new knowledge to elucidate the course of reactions or changes occurring in foods, whether natural or induced by handling procedures. (From: McGraw Hill Encyclopedia of Food Science and Technology, 1992, McGraw Hill.) Food science and technology are so inextricably linked that they are usually treated as one field of study in universities.

2.2 Subject scope

Food Science and Technology developed as a discipline to systematically organize and link the various kinds of knowledge which are necessary to inform human activity in food handling, processing, distribution and marketing. Food science draws on research and applies principles and practices from a broad spectrum of applied and basic sciences, including: biology (botany, bacteriology, microbiology, mycology), chemistry (biochemistry; physical, analytical, and organic chemistry), physics (rheology, thermodynamics, cryogenics, radiophysics, ultrasonics), nutrition, psychology (sensory behaviors), medicine (metabolism, toxicology, heart diseases), and economics. Food technology applies the principles and concepts of engineering to problems of food handling and processing, and studies the interrelationships between the properties of materials and the changing methods of handling and manufacturing them.

The food business and food technology are practically inseparable. The food business may be characterized as: vulnerable to spoilage, high volume, low margin, multiple products, transportation intensive; and end user marketing intensive. Since WWII the value added part of the food industry has increased steadily, and in 1980 surpassed agriculture's contribution. There is great emphasis on speed and efficiency in production, and on optimization of the food system from production through consumption. It has even been predicted that "nutrient delivery packages", customized for particular situations, will be developed to take the place of traditional "meals". Related research areas include: biotechnology to produce new strains of plants for foods and more efficient manufacture of food components; molecular and structural properties of foods and how they affect the conversion, processing, distribution, storage and acceptance of foods; biosensors to monitor food operations; and development of robot technology in food manufacturing.

Publications on the following specific topics comprising food science and technology are collected at Mann Library at a Research Level (4) unless otherwise noted:

1. Food analysis and chemistry

Physical, organic and biochemical properties of food constituents at the molecular level. Techniques (gravimetric, volumetric and spectrophotometric) used by food analysts for proteins; carbohydrates; lipids, fats oils; colloids; enzymes; vitamins, emulsifiers, acids, oxidants, antioxidants, pigments and flavors; secondary plant metabolites in food.

2. Food quality factors and their measurement

Appearance, textural, flavor, nutritional, sanitary, and keeping factors; quality standards; sensory evaluation techniques and programs; consumer acceptance; taste panels.

3. Nutritive aspects of food constituents and effect of processing and handling

Nutrient stability; effects on nutrients of agricultural practices, handling, processing, and storage on raw and processed foods; includes effects of cultivation, harvest, cleaning, freeze preservation, heat processing, baking, extrusion, moisture removal, fermentation, food additives, ionizing radiation; effects of home preparation and commercial foodservice practices; enrichment and protein complementation of foods; improvement of nutritional quality through plant breeding; role of the government in regulating nutritional value of the food supply.

4. Food microbiology, mycology, and toxicology

Use of yeasts, molds, and bacterias in production of foods and food ingredients; microbes in fermentation, processing and preservation; spoilage microorganisms; indicator and foodborne pathogens; detection, identification and physiology of microorganisms of importance in foods; microbiological culture, monitoring, testing, and sampling methods; tools of molecular biology in detection of microbes; psychotrophs, thermofiles and radiation-resistant microorganisms; biology, culture and isolation, and identification of important fungi; quantification of fungal toxins; food toxins and toxicity. A list of yeast and bacteria families in which Mann collects systematics and biology is available in the Systematics policy.

5. Food processing and engineering (general engineering aspects collected by the Engineering Library, specific food engineering applications collected by Mann; see 5.0 below)

Fundamental engineering concepts, such as: momentum, heat, and mass-transport systems; engineering aspects of food processing plant operations and automation; unit operations in food processing; food packaging materials, methods, testing and evaluation, effects on shelf life, economics; process control, optimizing automation; waste management; energy conservation; quality control.

6. Food product development

7. Commodity topics

All aspects of food science and technology of specific commodity groups, including: milk and milk products (fluid milk and derivatives, ice cream and related products, cheeses); meat, poultry and eggs; seafoods; fats, oils and related products; cereal grains; legumes; oilseeds; vegetables and fruits; beverages; confectionary and chocolate products.

8. Food safety and regulation

Food sanitation as related to public health and food plant processing; FDA and USDA rules and regulations; food ingredient labeling; nutrition labeling; food law (treatises and handbooks collected at Mann, actual laws and related scholarly works collected at Law Library); food additives; foodborne diseases, detection, identification; governmental and nongovernmental agencies concerned with food safety; current issues, such as salmonella in eggs.

9. The food industry

Publications of major trade associations; industry standards; structure of the food industry; international food corporations; N.Y. food industry; information on allied industries, e.g. packaging (steel, aluminum, glass, paper, plastic), chemical manufactures (acidulants, preservatives, enzymes, etc.), and food machinery and equipment manufactures is collected by Engineering Library (technical aspects) and JGSM Library (business and finance).

Popular, or consumer, works on home processing or food safety will be collected selectively. Marketing of food products and food prices are of interest, but are low priority.

Exclusions: Geneva, not Mann, will collect works on home and industrial brewing and enology.

2.3 Emerging trends in the subject area

Increased concern about the nutritional content of technologically derived, refined foods is expressed by both consumers and nutritionists. Dietary guidelines and nutrition education focus on partially replacing refined foods with whole grains, legumes, and other foods which retain their biochemical unity. Concern about food safety issues is very strong. Food scientists are responding to these nutritional and safety concerns in a variety of ways, including increased attention to food interactions and bioavailability of nutrients, improved analytical and detection methods, and research and education in food safety. New product development, particularly in the area of reduced-fat and reduced-calorie products is predicted. New processing technologies such as high energy electric pulse processing, freeze concentration, and hydrostatic pressure processing (which are often not yet available in the U.S.) show promise. Biotechnology is a growing area.

3.0 SPECIAL INFORMATION NEEDS AND RESOURCES

3.1 Special information needs of those working in this subject area.

3.2 Special collections or noteworthy resources in the field

3.3 Endowment funds or special funding arrangements

- Rice Fund -- poultry

4.0 TYPES OF MATERIALS

4.1 Priorities for types of materials

See [Priorities Table](#).

Food Chemical News, laws and regulations, standards (research, trade, national, intl?), USDA, FDA

In general, conference proceedings are a low priority as the information is no longer new.

Monographs with separately authored chapters are of critical importance.

Trade journals are very useful for career development purposes.

Undergraduates need solid reference books and upper division textbooks.

ACS Symposia on Food Chemistry are useful.

4.2 Format

4.3 Geographical guidelines

U.S., Canada, European Community, Australia, New Zealand, Japan.

4.4 Language guidelines

English, Spanish, German,

4.5 Chronological guidelines

Current materials

5.0 OTHER RELATED LIBRARY COLLECTIONS

- Engineering Library-- technical aspects of food processing, general engineering
- Hotel Library-- food service, cookery, gastronomy
- JGSM-- business and financial aspects of food science
- Law Library-- actual laws on food safety and regulation
- Physical Sciences-- biophysics, some biochemistry
- Olin-- history of food practices
- Veterinary-- microbiology of food science, clinical microbiology, epidemiology, animal nutrition and health

6.0 POLICY QUESTIONS, COLLECTION NEEDS, FUNDING PROBLEMS OR OPPORTUNITIES

Should we continue the current distribution between Mann and Geneva, wherein Geneva collects materials on fruit and vegetable processing and Mann collects on others? The weekly publications from CRC Press on food labeling, chemical news and food safety are still useful but expensive. Individual department members may offer to donate their personal subscriptions.

To do: Sort out the scope of Cornell's total interest in microbes (algae?, protozoa, fungi, bacteria, viruses, and yeasts?), both of applied

interest in plant pathology, food science and human health, and of basic biological interest in the Section of Microbiology. Make lists of families or genera in which we collect systematics. Consult Don Graham re microbes and fungi of interest in food science. Systematics will be developed in a general Systematics policy statement.

Discuss with Olin and Hotel collecting the history of various foods.

7.0 PRINCIPAL LC CLASSES

TP368-456
 TP500-659
 TS195-198
 TP1950-1982
 TP2120-2159
 TX341-641

8.0 RELATED COLLECTION POLICIES

- o [Agricultural Economics](#)
- o [Animal Science](#)
- o Biochemistry
- o Horticulture
- o Microbiology (However, the interests of this section have diverged from food microbiology),
- o Nutrition -- indigenous food practices, developing countries
- o Plant Pathology
- o Agricultural and Biological Engineering
- o International Agriculture and Development -- indigenous food practices, developing countries

Priorities Table for Food Science

Code	IMPORTANCE/INTENSITY CODES DEFINITIONS
NA	Not applicable to the discipline.
0	Ephemeral; of insufficient value to be provided by library.
1	Of short term interest, but with little or no enduring value; very selectively acquired; retained, uncataloged, for limited duration only, e.g. newsletters in newly emerging, poorly documented areas, and manuals or pamphlets for reserve reading.
2	Limited scholarly interest or utility; collected very selectively, but not of high priority.
3	Important for research and/or instruction; should be well represented, but collected selectively rather than intensively.

4	Very important for faculty and/or students; intensively collected, i.e. every effort is made to provide as deep coverage of this literature as possible.
5	Essential to work in the discipline; the most important type of material for research or instruction purposes. Ensuring the highest possible coverage should be the library's top priority in this discipline.

Code	SERIALS	Notes
5	Journals, scholarly	-
4	Journals, technical	-
-	Journals, other (describe)	-
5	Annual reviews, advances in...	-
4	Scientific and technical reports and research bulletins of major academies, learned societies, professional research and educational organizations and government agencies	-
3	Proceedings, of international congresses and symposia	-
3	Proceedings, national or local	-
-	Statistical series	-
4	Trade journals and periodicals	-
-	Popular periodicals, hobby	-
-	Popular periodicals, semi-technical	-
-	Popular periodicals, farm press	-
2	Newsletters/newspapers	-
3	Proceedings of legislative bodies	-
-	Student publications	-
3	Administrative publications of major academies, learned societies, professional, research and educational organizations and government agencies	-
4	Corporate annual reports	-
-	Yearbooks	-

-	Press releases	-
-	Lists	-
-	Working papers	-
Code	MONOGRAPHS	Notes
4	Major scholarly monographs	-
4	Professional and technical	-
2	Subject histories	-
5	Textbooks, upper division, graduate	-
2	Biographies	-
-	Popular monographs	-
3	Technical reports	-
3	Government reports	-
2	Proceedings, international	-
2	Proceedings, other	-
2	Theses and dissertations (outside CU)	-
-	Festschrift	-
-	Patents	-
-	Corporate histories	-
-	How-to books & lab manuals	-
-	Pamphlets	-
-	Ephemera (describe)	-
-	Maps	-
-	Technical bulletins/handbooks/compendia	-

Code	ELECTRONIC INFORMATION	Notes
5	Applications programs	-
5	Bibliographic databases	-
3	Bulletin boards	-
5	Fulltext files	-
4	Geographic information systems	-
4	Numeric/statistical files	-
-	Other (describe, taking as much space a necessary)	-

Completed by: Sam Demas; edited by Henry Murphy
Revised by Linda Stewart
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[Top of Page](#)