

FOOD 510 – Special Topics – Advances in Food Science

Winter Session Term 1 (Sept- Dec 2009)

Mondays 9:00 – 10:30 am in FNH 300

Wednesdays 9:00 – 10:30 am in FNH 300

Instructor:

Professor Eunice Li-Chan, Ph.D.

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There are no set office hours for our course. Students are encouraged to contact the instructor during class or through WebCT-VISTA internal mail or e-mail to make an appointment.

Course Description and Objectives

This course examines key concepts, current issues and advances in food science that are pertinent to professionals working in food industry, academia, and government.

Given the diversity of students in the Food Science graduate program, a primary objective of this graduate course is to provide a sound basis for the exploration of topics in food science at a graduate level. It seeks to achieve this by fostering an intellectual milieu that acknowledges and benefits from integrating the knowledge and experiences of students with different academic, work experience and cultural backgrounds.

Fundamental concepts as well as recent advances in food science will be explored on topics including

- the food processing operations that are used to convert primary agricultural and fishery crops into consumable foods
- the chemistry and analysis of food systems that are related to food quality and sensory perception
- factors and processes affecting safety and shelf-life of foods
- food laws and regulatory agencies
- new technologies, research and development

In the context of examining these topics, a second objective of this course is to facilitate a learning environment that encourages diversity and cooperation in team work, the sharing of objective knowledge and subjective views, as well as opportunities for personal reflection, exploration and creativity. It is hoped that the experiences of this course will cultivate a passion for lifelong learning of the ongoing advances in food science.

Learning Outcomes

- Upon successful completion of this course, students will have acquired a fundamental understanding of the multidisciplinary components that define the field of food science.
- You will develop skills to research and critique scientific literature, and to objectively evaluate the validity or credibility of information heard or seen in the media related to food science
- You will be able to convey factual information and personal views through oral and written communication, both in informal settings and in formal presentations and reports.
- You will participate actively and effectively in team work
- You will be familiar with the network of professional associations or societies involved in food science and technology
- You will select topics and areas in food science that are of particular interest to you for more in-depth learning, investigation and research.
- You will gain confidence in integrating and applying this information to
 - identify and control the factors that impact food quality and safety
 - define problems in food science and generate ideas to solve these problems
 - evaluate the present state of knowledge and practice in the food industry
 - assess the impact of emerging trends
 - generate new knowledge through basic or applied research

Structure/Format of Course to Achieve these Objectives & Learning Outcomes:

The class will usually meet twice a week, for 1.5 hours each on Mondays and Wednesdays.

During this class time, the instructor will provide an overview and background about the topics for discussion, and facilitate class discussions. (Please refer to accompanying document for information on tentative schedule and topics)

Students will complete background and assigned readings (before each class), and actively participate in group discussions and question/answer sessions on the topics under discussion.

Students will work in groups to conduct more detailed research on specific sub-topics for each of two assignments. The groups will summarize their findings to colleagues in class using oral presentations and brief handouts, and will lead the class in discussions on these topics.

Students will write a term report on a specific topic of their choice on advances in food science.

Evaluation of learning/Grades

Participation in discussions (in-class)	5%
Journal	15%
Group Assignment #1	20%
Group Assignment #2	20%
End-of-Term Report	40%

(Note that there will not be any final exam for this course)

Schedule of Assignments, Journal and End-of-term Report

	<i>Date</i>	<i>Topic</i> ¹
Assignment 1 (group)	October 5, 7, 14 in class ²	Group selection, by Sept 28
Assignment 2 (group)	Nov 25, 30 & Dec 2 in class ²	Group selection, by Nov 9
Journal (Individual)	December 4 ³	Journal entries on ongoing topics
Term Report (individual)	December 14 ³	Your selection, by Nov 23

¹ Please refer to Page 5 for description of assignments, journal and end-of-term report

² An electronic copy of your summary report must be posted on the VISTA Discussion board at least 24 hrs prior to your group's presentation in class

³ please submit a **hard copy** of the journal and the term report before 4 pm on the date noted above, either directly to the instructor (FNH 212) or via the FNH office on the 2nd floor. An **electronic copy** (word processing file) of the term report should also be sent to the instructor via Internal Mail on WebCT-VISTA by the date noted above.

Course Resources

Background Reading – for those who have not previously taken any general food science courses, or for anyone who wishes to obtain a refresher, please read through the "background readings", posted on our WebCT **VISTA** course (login at www.vista.ubc.ca), which are adapted from the undergraduate course "Exploring our Food". You are welcome to explore the "activities" and "questions" that are posed in these lessons, but you are not required to complete them in the form of assignments for handing in as part of our graduate course.

Lesson 1:	Food Science & the Canadian Food System
Lesson 2:	Chemical and Physical Properties of Food
Lesson 3:	Fat & Sugar Substitutes
Lesson 4:	Food Standards, Regulations & Guides
Lesson 5:	Food Preservation
Lesson 6:	Thermal Preservation of Foods
Lesson 7:	Low Temperature Food Preservation
Lesson 8:	Dehydration for Food Preservation
Lesson 9:	Food Preservation with Biotechnology
Lesson 10:	Preservation of Food with Ionizing Energy
Lesson 11:	Effects of Food Processing on Nutrient Retention
Lesson 12:	Toxicants in Food & Food-borne disease
Lesson 13:	Trends in Foods for Nutrition and Health

Additional Supplementary Readings – a selection of readings related to the topics under discussion (see tentative schedule at the end of this document) have been taken from IFT Scientific Status Summaries, Trends in Food Science & Technology, Food Technology, Journal of Food Science and other food science publications. Please go to our online VISTA course for more information and to access the supplementary readings.

UBC Library

Students will be required to conduct library research on specific topics for your group assignments and end-of-term report. For some tips on resources available from the UBC library website, follow this link: <http://www.library.ubc.ca/home/instruct/publist.html>

Alternatively, you may prefer to go to this webpage for more specific tips related to **research in food science**: <http://toby.library.ubc.ca/subjects/subjpage1.cfm?id=90>

Here is a link for useful information on "Citation Style Guides":

<http://www.library.ubc.ca/chapmanlearningcommons/citation.html>

Please follow the **APA Style** for the group assignments and for your final formal report.

A warning about Plagiarism and Academic Misconduct:

Please check out the UBC Plagiarism Resource Centre <http://www.library.ubc.ca/home/plagiarism/> and ensure that you understand what qualifies as plagiarism when working on your assignments, journal writing and final report.

In addition, academic misconduct includes "submitting the same, or substantially the same, essay, presentation, or assignment more than once (whether the earlier submission was at this or another institution) unless prior approval has been obtained from the instructor(s) to whom the assignment is to be submitted." (UBC Calendar 2009/2010, <http://www.students.ubc.ca/calendar/>)

You are encouraged to use "**Turn-It-In**" at www.turnitin.com as a resource for checking your work for plagiarism. Our course ID is **2828908**, and the password is **2009w**.

Description of Group Assignments, Journal, and End-of-Term Report

1. Group Assignments

The objective of the group assignments is to work as a team to research, understand and communicate information about a specific topic related to advances in food science

Guidelines for group work:

Each group will consist of 3 students. You may self-select into a group, as long as you meet the following criteria – you cannot have previously studied at the same university as another student in your group, and at least one group member must be from a different country of birth.

Assignment Description:

Assignment 1 – Each group will give a 30 minute presentation on a different specific topic of their own choice, within the indicated subject areas.

Assignment 2 – Pairs of groups will give 20 minute presentations to provide different perspectives on one of the three specific topics, and then lead the class in a discussion or debate on those topics.

Please refer to the following pages for more details on each of the assignments.

Grading of Assignments:

Assignments #1 and #2 are each worth 20% of your total mark.

Your assignments will be assessed for the content (quality of information), as well as the effectiveness and clarity of the oral presentation and written summary report. Please refer to the evaluation template sheet on VISTA.

Group evaluation – Group assignments will earn an overall group mark, which may then be adjusted to reflect participation of individual students in the group.

Please complete the **group self-evaluation form** using the template posted on VISTA at the end of term and submit to your instructor on or before **Dec 4, 2009**.

Assignment 1

Please select a specific topic that addresses an interesting problem, issue or advance in food science within one or more of the following general areas:

**Trends in food consumption or recent issues related to farm-to-fork food production;
Chemical and physical properties of food; Role and regulations of food additives;
Functional foods & nutraceuticals & natural health products**

Topic must be submitted for instructor's approval **by Sept 28**
Presentation dates: **October 5, 7, 14** (2 groups per day)

Sample ideas for specific topics for assignment 1:

Sample ideas for specific topics are listed for illustrative purposes. You may adapt and focus on aspects of one of these ideas as your group's topic, but you are also strongly encouraged to identify other specific topics that are of particular interest to your own group

- Organically versus conventionally grown produce – myths vs facts
- Neotame, the new sweet kid on the block
- Omega-3 fatty acids as natural health products or functional food ingredients
- *Trans* fatty acid free food products – opportunities and challenges
- Advances in formulation of hypoallergenic infant formula
- Innovations in salt replacers – search for the holy grail

Suggested steps to complete assignment 1:

1. Brainstorm, discuss and decide on a specific topic of mutual interest within the designated topic areas for each assignment (see below).
2. Inform the instructor of your proposed topic. For assignment #1, each group must present on a different specific topic. In case of duplicate topic selection from more than 1 group, approval by the instructor will be on a first-come-first serve.
3. Organize yourselves to conduct further research on the approved selected topic.
4. Meet to share your findings and to select appropriate information for presentation in class. Although you may use 1-2 review articles to get an overview of the topic, please be sure to dig deeper via primary peer-reviewed articles in the scientific literature
5. Prepare a **30 minute oral presentation**, using visual aids such as Powerpoint slides, hard copy handouts, sample products etc.
6. Write a **summary report** (one per group) including the following: (a) **Abstract** (\leq 150 words); (b) 1-2 Page **Summary** of the topic (\leq 500 words; don't repeat the abstract); (c) **References** (no limit, but please asterisk 3 key references).
7. Hand in hard copy of summary report to instructor & post an electronic copy to the VISTA Discussion Board at least 24 hours before the presentation.
8. Present your topic in class; initiate further discussions and answer questions.

30 minute presentations + 10 minute Q/A period
Summary report due at least 24 hr before presentation

Assignment 2

Select one of the three topics below and decide on which perspective* you wish to present

1. **Biotechnology for production of foods, ingredients or additives**
2. **Nanotechnology-based delivery systems for bioactive substances**
3. **Food irradiation to reduce risk of foodborne illness**

* For each topic, one group will present on the pros (advantages, opportunities, benefits ...) while the other group will present on the cons (disadvantages, challenges, risks ...)

Topic selection must be submitted to instructor for approval **by Nov 9**
Presentation dates: **November 25. 30 and December 2** (2 groups per day)

Suggested steps to complete assignment 2:

1. Brainstorm, discuss and decide on which of the three designated topics your group wishes to research and present.
2. Inform the instructor of your proposed selection as soon as possible, and by Nov 9 at the latest. Since there can only be two groups presenting on each of the 3 topics, approval by the instructor will be on a first-come-first serve.
3. Organize yourselves to conduct further research on the approved selected topic.
4. Meet to share your findings and to select appropriate information for presentation in class. Although you may use 1-2 review articles to get an overview of the topic, please be sure to dig deeper via primary peer-reviewed articles in the scientific literature
5. Meet with the other group that is working on the same topic as your group, and decide on which group will present on the pros, and which group on the cons.
6. Each group should prepare a **20 minute oral presentation**, using visual aids such as Powerpoint slides, hard copy handouts, etc. You may wish to coordinate with the other group regarding the organization of your two presentations (total 40 minute presentation time for both groups)
7. Write a **summary report** (one per group) including the following: (a) **Abstract** (\leq 150 words); (b) 1-2 Page **Summary** of the topic (\leq 500 words; don't repeat the abstract); (c) **References** (no limit, but please asterisk 3 key references).
8. Hand in hard copy of summary report to instructor & post an electronic copy to the VISTA Discussion Board at least 24 hours before the presentation.
9. Present your topic in class; initiate further discussions and debate by everyone in the class.

20 minute presentation per group (total 40 min) + 40 minute Q/A & debate period
Summary report due at least 24 hr before presentation

2. Experiential Journal

The objective of the journal assignment is to relate your understanding of key concepts, issues and advances to your personal experiences or opinions. How has what you learned changed your opinion and understanding, or informed you about specific aspects of food and food science? Did you learn something interesting by doing a literature search, reading about and exploring further into specific topics?

Throughout the term, make journal entries reflecting on what you have learned each week in class and from your readings.

Remember to date your journal entries, and to write regularly (at least weekly). Each entry does not need to be long; one or two pages may suffice, depending on your experiences each week.

Please use minimum font size equivalent to Times New Roman 12 or Arial 11 for your journal.

Submit sample journal entries no later than October 19 if you would like some feedback.

Hand in your journal for marking at the end of term – deadline **Friday Dec 4, 2009.**

Grading – The journal is worth 15% of your total mark.

Your journal will be assessed for content (quality of information) as well as the effectiveness and clarity of your writing. Please refer to the "Forms" on our VISTA course for the evaluation template.

3. Final End-of-Term Report

The objective of the end-of-term report is to integrate and apply what you have learned with your particular interest in a **specific topic in food science**, to conduct library research on this topic, and to communicate your findings in a written report

Guidelines for final end-of-term report:

– Topic – you may select any topic related to advances in food science

Ideas generated from class discussions may be suitable for further development as topics for the report, but the depth and/or scope of the report must go beyond what has already been discussed in class.

- Each student must research and write on a different specific topic.

To avoid overlap or duplication of topics among students, please discuss your proposed topic with your instructor early in the term. You must convey your final selected topic (tentative title of your report) to the instructor by VISTA MAIL for **approval no later than November 23rd.**

- You must demonstrate that you researched the literature in preparation for writing the report.

The bibliography for your report may include some review articles and information from credible websites, but the majority of references must be from primary, peer-reviewed sources (scientific journals).

- Format for the report –

This is a formal report, and should be typed in double-spaced format, with minimum font size equivalent to Times New Roman 12 or Arial 11. Please use the APA style for citing and listing the references.

The report should be ~8-10 double-spaced pages (~ 2000-2500 words), not including the cover page, reference list, and any tables or illustrations that you may wish to include.

You may wish to organize your report into the following sections:

- Cover page (Title of the report, name, student number, course name, date)
- Abstract
- Introduction (briefly introduce the topic and why you selected it)
- Main Content (use specific descriptors for this heading and/or additional subheadings based on your topic)
- Conclusions
- Bibliography or List of References

- Hand in a hard copy to instructor, and submit the e-file on WebCT VISTA by **Dec 14, 2009**

Grading – This report is worth 40% of your total mark. The report will be graded for quality of the content as well as clarity of writing – refer to the "Forms" on our VISTA course for the evaluation template.

Tentative Schedule, Topics and Readings for FOOD 510 – 2009w

Date (2009)	Background reading ¹	Topics for discussion ²
Sept 9	1	<p>Introduction to the Course Our Food System – Consumer trends, Farm-to-Fork issues</p> <p><i>Exploring further – What are the pros and cons of organic food? Processed/pre-packaged versus "raw"/"unprocessed" foods? Local versus global markets? Are we sustainable in using our natural resources? What factors affect consumer trends and how do/should food scientists respond to these trends?</i></p>
Sept 14, 16	2	<p>Chemistry, Function of Food Components (Chemistry of food systems, composition, sensory, colour, texture of foods)</p> <p><i>Exploring further – What is the relationship between food composition/structure and function/properties? What is the role of the food scientist in food product development? Comparing tissue systems and further processed/packaged food products – do only the latter contain undesirable constituents (e.g. trans fatty acids, acrylamide, oxidation products, allergens)?</i></p>
Sept 21	3	<p>Fat and Sugar Substitutes (fat replacers, sweeteners)</p> <p><i>Exploring further – How do protein, carbohydrate and fat-based fat replacers differ? What about sweeteners vs sweetening agents? Why are some allowed only as table-top sweeteners, or natural health products, while others can be used in food? What properties do these fat and sugar substitutes need to possess? How are they measured?</i></p>
Sept 23		<p>Group discussions and time for group work on Assignment #1– topic must be finalized/approved by Sept 28</p>
Sept 28	4	<p>Food Standards, Regulations & Guides; Food Additives</p> <p><i>Exploring further – What is involved in assessing safety of food additives? What are the requirements for labelling of foods? How do Canadian regulations compare to those in different countries? What about imports/exports? What are your thoughts on allowing synthetic sweeteners or trans fatty acids in food?</i></p>
Sept 30	4, 13	<p>Functional Foods and Nutraceuticals, Natural Health Products and Novel Foods</p> <p><i>Exploring further – What is the difference between these? How do the regulations for natural health products differ from those of foods? Drugs? What about the regulations for novel foods? Traditional medicines? What are the issues related to risk-benefit assessment?</i></p>

¹ Numbers refer to the Lesson # in the “Background reading” posted on WebCT VISTA.

² For greater scope and depth of the issues and advances in food science please refer to the “Supplementary readings” at the end of this document and also posted on our VISTA course.

Date (2009)	Background reading ¹	Topics for discussion ²
Oct 5		Two group presentations for Assignment #1 ³
Oct 7		Two group presentations for Assignment #1 ³
(Oct 12)		(No class – Thanksgiving Monday holiday) Remember to do a journal writing midterm check before Oct 19
Oct 14		Two group presentations for Assignment #1 ³
Oct 19, 21	5, 11, 12	<p>Rationale for Food Preservation; Food safety - Toxicants in Food (& Foodborne Disease); Effects of Processing on Quality</p> <p><i>Exploring further – .What are the factors that lead to spoilage and health hazards of food? What is the hurdle concept? Do “fresh” fruits and vegetables need to be processed? Is nutrient value always reduced by processing? What other changes could result from processing? Can processing lead to formation of toxic or carcinogenic compounds? Are there toxic substances in our food supply, and why?</i></p>
Oct 26, 28	6-10	<p>Technologies for food preservation - Thermal Preservation of Foods; Irradiation; Low temperature; Dehydration: Fermentation</p> <p><i>Exploring further – .What is the scientific basis for these technologies in terms of their effects on factors related to food spoilage and safety. How are the necessary process conditions established? What are some of the issues in their application? Advances in technologies?</i></p>

¹ Numbers refer to the Lesson # in the “Background reading” posted on WebCT VISTA.

² For greater scope and depth of the issues and advances in food science please refer to the “Supplementary readings” at the end of this document and also posted on our VISTA course.

³ Remember to submit your "Summary Report" at least 24 hrs prior to the presentation

Date (2009)	Background reading ¹	Topics for discussion ²
Nov 2		<p>Biotechnology & nanotechnology</p> <p><i>Exploring further – .What is the role/impact of these technologies in the food industry? In research?</i></p>
Nov 4		<p>Group discussions and time for group work on Assignment #2 – topic must be finalized/approved by Nov 9</p>
Nov 9		<p>Food science and the “-omics” era</p> <p><i>Exploring further – .What is meant by nutrigenomics? Proteomics? Metabolomics? What role or impact could they have in food science?</i></p>
Nov 11		<p>Remembrance Day – no class</p> <p>Remember to submit the topic for your end-of-term report by Nov 23</p>
Nov 16, 18		<p>Advances in analytical methods, quality control</p> <p><i>Exploring further – .What is chemometrics? What are some trends in methodologies for detecting adulteration? GMO? Food quality?</i></p>
Nov 23		<p>Group discussions and time to work on assignments</p>
Nov 25		<p>Group presentations (two groups/day) for Assignment #2 ³</p>
Nov 30		<p>Group presentations (two groups/day) for Assignment #2 ³</p>
Dec 2		<p>Group presentations (two groups/day) for Assignment #2 ³</p>

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³ Remember to submit your "Summary Report" at least 24 hrs prior to the presentation

Table of Contents for
Supplementary Readings
[Supplementary Readings](#) 

Click on the readings below each of the topic headings to open the pdf files).

This reading list was compiled to illustrate some of the issues and advances in food science, beyond the fundamental concepts described in the "Background reading".

You do not need to study the details of these supplementary readings. The readings are intended to serve as a starting point for ideas that may be developed into topics for further investigation as part of your group assignments and end-of-term report. We may also explore some of these topics during our class discussions.

CONSUMER TRENDS

[Roodenburg & Leenen. 2007. Food composition database & innovation
Robbins \(AAFC\) Canadian trends to 2020](#)

FARM-TO-FORK ISSUES

[Winter and Davis. 2006. Organic Foods \(Sci Stat Summary\)](#)
[Zhao et al 2007. Sensory - Organic vs conventionally grown foods](#)
[Shewry et al 2007 GM and conventional cereals](#)
[Blanco et al. 2007 Towards sustainable and efficient use of fishery resources](#)

CHEMICAL, PHYSICAL, FUNCTIONAL PROPERTIES

[Goesaert et al. 2005. Wheat flour constituents & bread quality](#)
[Gallagher et al. 2004. Gluten-free cereal based products](#)
[Doehlert et al 2009 Green oat story](#)
[Moon LiChan 2007a Simulated Beef Flavour and Soy Protein Interactions](#)
[Moon LiChan 2007b Simulated Beef Flavour SPI and Ingredient Interactions](#)

REGULATIONS AND RISK ASSESSMENT

[FAO. 2006. Food Safety Risk Analysis \(119 pages\)](#)
[Lelieveld & Keener. 2007. Global harmonization of food regulations](#)
[van Putten et al. 2006. Novel foods and food allergies](#)
[Health Canada Task force report - TRANSforming the food supply](#)
[CFIA. Trans fatty acids - healthier alternatives](#)
[Chau and Wu. 2006. Regulations of Chinese herbal medicine](#)
[Mutukumira. 2007. Food Safety in sub-Saharan Africa \(World Food Science website\)](#)

Additives

[Kroger, Meister & Kava. 2006. Low-calorie sweeteners ... safety issues \(Sci Stat Summary\)](#)

FUNCTIONAL FOODS, NUTRACEUTICALS, NATURAL HEALTH PRODUCTS

[Hasler. 1998. Functional foods \(Sci Stat Summary\)](#)
[Zhang 2007. Can food-derived multipotent agents reduce risk of Alzheimer's disease](#)
[Omoni and Aluko. 2005. Anti-carcinogenic and -atherogenic effects of lycopene](#)

[Cook et al. 2007. Clinical trial of Vit C, E, beta-carotene in secondary prevention of cardiovascular events in women](#)

PROCESSING AND EFFECTS ON QUALITY

[Kwon et al. 2004. Food technology: challenge for health promotion](#)

[Schieber and Carle. 2005. Carotenoid isomers](#)

[Galgano et al. 2007. Processing effects ... on health promoting compounds in broccoli](#)

[Moreno et al. 2007. Effects of stir-fry cooking on phytochemical composition of broccoli](#)

[Mozaffarian et al. 2006. Trans fatty acids and Cardiovascular disease](#)

[Roos. 2006. ... Behavior of aroma compounds in thermally processed foods](#)

[Skog. 2007. The HeatoxProject](#)

[Claeys et al. 2005. Quantifying the formation of carcinogens during food processing: acrylamide](#)

[Belcalski et al JAFC 2003 acrylamide in foods](#)

[Canada adds acrylamide to list of toxic substances](#)

[Gerrard. 2006. The Maillard reaction in food ...](#)

[Visciano et al. 2007 JFB histamine](#)

PROCESSING TRENDS

[Benner et al. 2007. Development of tomato ketchup with potential health benefits using the Chain Information Model](#)

[Ubbink and Kruger. 2006. Physical approaches for delivery of active ingredients in foods](#)

[Chen et al. 2006. Food protein-based materials as nutraceutical delivery systems](#)

[Hidalgo and Zamora. 2006. Peptides and proteins in edible oils](#)

[Marnoch et al Mustard protein isolate by membrane processing](#)

[Cinq Mars Li Chan 2007 RSM optimization of bioactive peptide production](#)

[Cinq-Mars 2008 Investigating ACE inhibitory peptides from hake](#)

[Marsh & Bugusu. 2007. Food Packaging \(Sci Status Summary\)](#)

[Rico et al. 2007. Extending and measuring quality of fresh-cut fruit and vegetables](#)

[Allende et al. 2006. Minimal processing for healthy traditional foods](#)

[Lewicki. 2006. Design of hot air drying for better foods](#)

[Toldra. 2006. Role of muscle enzymes in dry cured meat products](#)

[Chua & Chou. 2003. Low-cost drying methods for developing countries](#)

[Zheng & Sun. 2006. Power ultrasound during food freezing](#)

[Gomez-Lopez et al. 2007. Pulsed light for food decontamination](#)

[Smith and Pillai. 2004. Irradiation and food safety \(Scientific Status Summary\)](#)

FERMENTATION AND 'GOOD' MICROBES

[Vasiljevic et al. 2007. B-glucan addition to probiotic containing yogurt](#)

[Tuohy et al. 2005. Modulation of human gut microflora using prebiotics](#)

[Reid. 2005. Guidelines for development and application of probiotics](#)

[O'Sullivan. 2005 Probiotics: an emerging therapy](#)

[Anal and Singh. 2007. Microencapsulation of probiotics](#)

[Rogers. 2001. Preserving non-fermented refrigerated foods with microbial cultures](#)

NATURALLY OCCURRING TOXICANTS AND FOOD BORNE ILLNESS

[CFIA website - Specific Products and Risks](#)

[McEntire et al. 2004. Bacteria associated with foodborne disease \(Sci Status Summary\)](#)

[Hueston & Bryant. 2005. Transmissible spongiform encephalopathies \(Sci Stat Summary\)](#)

[Davidson & Harrison. 2002. Resistance and adaptation to food antimicrobials \(Sci Status Summary\)](#)

[Murphy. 2006. Food mycotoxins: an update \(Sci Status Summary\)](#)

[Nyachura et al. 2007. Impact of nitrite on detection of Listeria monocytogenes in RTE products](#)

[Health Canada 2006 Mercury in tuna update](#)

[Codex. 2007. RFI of foodborne illness in fresh produce.](#)

NEW TECHNOLOGIES - BIO, NANO ...

[Weiss et al. 2006. Functional materials in food nanotechnology \(Sci Status Summary\)](#)

[US FDA 2007. Nanotechnology task force report.](#)

[US FDA 2007. Nanoscale challenges \(consumer info\)](#)

[Hulse. 2004. Biotechnologies: past present future](#)

[DaSilva 2007 Colours of Biotech editorial](#)

[Li Chan et al 1998 JFB lactoferrin isolation](#)

[Kim et al 1999 Anal Bioc.AvidinBiotin IgY](#)

[Akita and Li Chan 1999 JDS IgG subclass](#)

[Clin Diag Lab Immunol 2002 IgY H pylori](#)

ADVANCES IN ANALYTICAL METHODS, QUALITY CONTROL

[Engel et al. 2006. Quantification of DNA from GMO in composite and processed foods](#)

[Rodriguez-Lazaro et al. 2007. Trends in analytical methodology ... microorganisms and GMO](#)

[Reid et al. 2006. Recent technological advances for determination of food authenticity](#)

[Cen and He. 2007. NIRS in determination of food quality](#)

[Wu et al 2004 Veg oil fingerprints by FT ICR MS](#)

[Zheng et al. 2006. ... image features for quality evaluation and inspection](#)

FOOD SCIENCE AND THE "-OMICS" ERA

[Penders et al. 2007... the meaning of "personalized" in nutrigenomics](#)

[Fogg-Johnson & Kaput. 2007. Moving forward with nutrigenomics](#)

[Carbonaro. 2004. Proteomics: present and future in food quality evaluation](#)

[Chan Li Chan 2007 JAFC Cationic peptides from bovine lactoferrin](#)

[Hemung et al 2008 Proteomics approach to study TGase action on Myosin](#)