The development of a web page for lipid science and research. Main web sites of interest

By A. Farran, J. Pascual*, J. Grillo, R. Codony and J. Boatella

Unidad de Calidad Nutricional y Tecnológica de los Lípidos (Food Lipids, Quality and Health Unit). Nutrition and Food Science Department, University of Barcelona-CeRTA Avda. Joan XXIII s/n. 08028-Barcelona (Spain) http://www.ub.es/qntl/

RESUMEN

Desarrollo de una página web en ciencia de lípidos para investigación. Principales sitios de la web de interés.

En internet encontramos gran cantidad de información científica-técnica cuya validez no suele estar controlada por comités correctores. Para aprovechar estos recursos es necesario filtrar y facilitar el acceso del usuario a la información. En este artículo se expone la experiencia práctica en el desarrollo de una página WEB centrada en las actividades del grupo de investigación «Calidad Nutricional y Tecnología de los Lípidos». Los objetivos de esta página WEB fueron los siguientes: difusión de las actividades del grupo de investigación, aprovechar los recursos que ofrece internet y fomentar y facilitar su uso. Esta experiencia permitió presentar una metodología de trabajo eficaz para conseguir estos objetivos. Finalmente, se presentan un gran número de direcciones WEB agrupadas por apartados en el ámbito de los lípidos. Estas direcciones han sido rigurosamente seleccionadas, entre un gran número de referencias consultadas, siguiendo una serie de criterios que se discuten en este trabajo, para ofrecer aquellas que presentan un mayor interés práctico.

PALABRAS-CLAVE: Ciencia de lípidos - Internet - Página web - Revisión (artículo) - Sistemas de información.

SUMMARY

The development of a web page for lipid science and research. Main web sites of interest.

Internet provide access to a huge of scientific and technical information on Internet which is not validated by any committee of experts. This information needs filtering in order to optimize user access to these resources. In this paper, we describe the development of a WEB page outlining the activity of our research team Food Lipids Quality and Health. The WEB page seeks to fulfill the following objectives: to communicate the activities of the team, to use effectively the resources that Internet offers and to promote their use among the team. We report on the methods used in achieving these objectives. Finally, a large number of WEB addresses related to Lipids are presented and classified. The addresses have been selected on the basis of their usefulness and interest value.

KEY-WORDS: Information systems - Internet - Lipid science - Review (paper) - Web page.

1. INTRODUCTION

Internet is an international computer network with a common communication protocol which manages a flow of large volumes of information. It allows any individual anywhere in the world to connect up to this network via his personal computer, at any time during day or night and to communicate with any other user wherever he might be (Thomas, 1996). In the initial stages of its development, Internet was used by universities to obtain scientific information and to establish contact between scientists and professors. In the meantime, Internet has become a powerful channel via which enterprises can market and sell their products. Internet today has grown enormously (Figure 1) and users have come to appreciate the great advantages of the system. Access to electronic information and its management is increasingly shifting and from the hands of experts to those of the users. Today, users are playing a much more active role (Anonymous, 1997).

There are three modes of communication via the electronic net. First, and most typically, is the one-to-one communication mode. Second, there is the one-to-many communication mode, which can be restricted (one way) or open in nature, as in a round table. Finally, there is access to different types of information resource, such as data file systems, libraries, journals, TV programmes, live presentations, etc., known as data bases. In each of these communication systems, the transferred information can be audio, visual, or even tactile (McLellan, 1995). A very wide set of tools are available for the various modes of electronic communication. E-mail is obviously the best known and most used tool. Today, 80% of Internet communications are via e-mail (Anonymous, 1997). It is also possible to access newsgroups, where users can post news, items, questions or comments on a specific subject. This is known as usenet and it accounts for about 15% of total Internet applications (McLellan, 1995). Those users subscribing to a listserv can send and receive up-dated information on any subject of interest to them. The listserv is managed by an

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owner, who can choose to make it public or private. The listserv can obtain a regulated or unregulated list which allows the owner to control access to the listserv. This tool has particularly useful applications in the area of scientific communications. Real time conversations can be held by two or more users simultaneously through the Internet Relay Chat (IRC). Finally, mention should be made of Internet videoconferencing, which currently has not been fully developed, but will with be of considerable importance in the future of scientific communications: attending workshops and meetings, remote teaching, sharing images, direct consultations with experts, professional communications, etc (Anonymous, 1997). Access to available information on the servers connected to an electronic network can be gained in a number of ways, including the File Transfer Protocol (FTP). Gopher and the WEB. The FTP allows computer files to be transferred from a remote server to the PC or viceversa. Gopher is a tool designed to facilitate access to available information located on computers connected to Internet, through a hierarchical menu system. The WEB is a similar service, but it uses hypertext technology which simplifies the access to available information.

Table 1 shows the main advantages and disadvantages of Internet as a communication tool (Thomas, 1996; Anonymous, 1997; Stewart, 1995).

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<th>Table 1</th>
<th>ADVANTAGES AND DISADVANTAGES OF INTERNET USAGE</th>
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<tr>
<td><strong>Advantages</strong></td>
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<tr>
<td>- Availability of mainly free information</td>
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<td>- Low cost of initial connection</td>
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<td>- Reduces the costs of divulgation</td>
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<td>- The same protocol of communication can be used for all the services</td>
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<td>- Facilitates rapid interactive communication</td>
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<td>- Facilitates the exchange of huge volumes of data</td>
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<td>- Facilitates the establishment of professional contact</td>
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<td>- No barriers to divulgation</td>
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<td>- Facilitates access to different sources of information, which is continuously up-dated</td>
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<td>- Facilitates management of companies information system</td>
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<td>- It is accessible from anywhere</td>
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<td>- It has become the global media</td>
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<td><strong>Disadvantages</strong></td>
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<tr>
<td>- Danger of overload and excess information</td>
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<tr>
<td>- It requires an efficient information search strategy</td>
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<td>- The search can be slow</td>
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<tr>
<td>- It is difficult to filter and prioritize information</td>
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<tr>
<td>- No guarantee of finding what one is looking for</td>
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<tr>
<td>- There is a lot of apparently unconnected information</td>
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<td>- Net becomes overloaded because of large number of users</td>
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<tr>
<td>- No regulation</td>
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<tr>
<td>- No quality control over available data</td>
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<tr>
<td>- The ease with which information can be constantly up-dated can cause problems of referencing</td>
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WEB has established itself as the most useful system on Internet and has enormous possibilities for the future given its ease of reading (good visual design), ease of consulting (good logical organization) and ease of searching (flexible search system). Its only shortcoming is the restricted amount of information that can be included to ensure user comfort at the moment of reading (Morgan, 1995; Matthaeus, 1998; Schlotke, 1996). This highlights the need to optimize the system, overcoming this disadvantage. The handling of large amounts of information requires a considerable effort in several aspects: defining clearly and concisely the information wanted; familiarization with the characteristics of the tools to be used; and the following of methodical protocols. In this way, we can avoid excess information and minimize the time need to obtain it (Blanchfield, 1996). More specifically, there are various services and software on the net for carrying out the information search, known as searching engines (Yahoo, Excite, Altavista, WebCrawler, Dönde?, Olé!, Archie, etc.). These searching engines can only be used when users understand well search procedure, which can vary from service to service. When the search is completed, the use of filters is recommended to sift out irrelevant material. These filters are still not very well developed, but can be obtained from specialized software, the subscribing services need for up-dating Internet information or through email consultant services. The main conclusion that can be drawn is that an optimized protocol must always be used for Internet search (McLellan, 1995).

In short, the way we handle the information is as important as the information itself. If we want to use the information efficiently, we must learn to select, guide and control the flow of information, in order to maximize our benefits (Anonymous, 1997). Our research team, working in the field of lipid science, has planned the design of a WEB page that seeks to fulfill the following objectives. First, we have sought to create a tool for communicating the scientific research work of our team, and then, to create a database of public interest for lipid scientists. The main objectives were: a) the diffusion of the activities of the research team (Lipids, Food Quality and Health Unit) at the University of Barcelona, using Internet as a vehicle to communicate with scientists and other professionals in the field of the lipids and lipid foods; b) to exploit the scientific and technical resources available on Internet in our field, mainly by facilitating and optimizing the search for specific information by team members; and c) to promote and facilitate the use of Internet in our daily work.

2. MATERIAL AND METHODS

First, we used the scientific and technical literature written by the experts in Food Science and
Below, we give some examples which allow the user to specify the main key words through logical connectors (and, or, not, near, etc.) themselves offer modern and powerful help tools, to adapt to the field of search. Indeed, the searchers a small number of key words must be used in order to adapt to the defined subject. Therefore, a suitable combination of a small number of key words must be used in order to adapt to the field of search. Indeed, the searchers themselves offer modern and powerful help tools, through logical connectors (and, or, not, near, etc.) which allow the user to specify the main key words. Below, we give some examples:

- oxysterols AND atherosclerosis
- cholesterol AND coronary AND heart AND disease
- (polyunsaturated OR monounsaturated OR saturated) AND fatty AND acids
- trans AND fatty AND acids AND lipoproteins
- (beta-carotene OR vitamin E) AND free AND radicals

We first surfed the net in order to visit the web page addresses that we had listed from a previous review of the scientific and commercial literature. Then we searched and visited the web pages corresponding to the main institutions, book and journal editors, etc. Finally, through the searchers above cited, and using the key words list, we searched any new interesting adresses to complete the areas in the general classification (see table 2). For selecting and recording the eventual addresses the following criteria were applied:

a) the reputation of the institution/enterprise publishing the page
b) the principal nature of the page (commercial, scientific or informative)
c) the value and originality of the content
d) the frequency of information up-dating
e) the supervision of content by advisory committees
f) the scores given by the searching engines to the addresses in relation to the keyword used

The addresses were then classified in the subgroups as previously defined, according to the main orientation of the web page and its characteristics. Due to the large number of addresses, all the information collected was entered on to a data base for case of handling. This data base manager also enabled us to transfer the information to the web page, using the HTML format. Before this transfer, a filtering process was applied in order to check the validity of the addresses and any possible defects of a formal nature. First, we checked for any repeated or unsuitable addresses (difficult or impossible access) or incomplete addresses. We also checked contents for information about human resources (contact with other research groups, information interchange), bibliographic resources (library catalogue consultation, electronic journals, reports offered by different organisms, etc.)

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<th>Table 2</th>
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<tr>
<td><strong>GENERAL CLASSIFICATION OF THE WEB ADDRESSES OF INTEREST</strong></td>
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<th>ANALYSIS AND QUALITY CONTROL</th>
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<td>FOOD SAFETY AND TOXICOLOGY</td>
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<td>FOOD TECHNOLOGY:</td>
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<td>Preservation and stability</td>
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<td>Fat replacers</td>
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<td>Technical processes and biotechnology</td>
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<td>HEALTH</td>
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<td>INDUSTRIES</td>
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<td>LIPID CHEMISTRY AND FOOD COMPOSITION</td>
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<td>Specific foods</td>
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<td>Food composition</td>
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<td>Lipid compounds</td>
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<td>NORMALIZATION AND REGULATIONS</td>
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<td>NUTRITION AND DIETETICS</td>
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<td>UNIVERSITIES AND R+D CENTERS</td>
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and material resources (acquisition of equipment and reagents, software, standards, etc.). Finally, we edited the web page, using Netscape Composer (although many other simple editors are available now on the market), according to the following guidelines. The page should be:

- clear (syntactical and semantic review)
- concise (maximum information occupying the minimum place)
- ordered (easy access and user friendly)
- universal (using one or more international languages)
- linked with other pages
- contain only essential images (since they occupy many bytes and slow down access to the page)

Edited and located on the server, the page must be actively diffused, using different means, such as specialized distributors, use of listservs, register at searchers, etc.

3. RESULTS

3.1. Activities undertaken by the research team (FLQH)

The first section of the page includes the main data and activities of our research team, Food Lipids, Quality and Health, providing information about: a) lines of research; b) members of the team (with electronic addresses); c) main publications and communications; d) main projects; and e) relationships with other research teams in the world. This allows, via e-mail, contact to be established with other researchers working in the same field and information, papers, etc. to be exchanged more easily.

3.2. Evaluation of web pages included in our data base

Annex 1 shows the list of the main Internet addresses classified in accordance with our criteria. The content of each group in this classification is discussed below.

INDUSTRIES. Addresses of enterprises working in different food sectors (raw materials, food products and services), and particularly in the field of oils and fats, antioxidants and fat foods. The American Oil Chemists Society page offers an exhaustive directory of fat and oil producing and distributing enterprises. Also, the Thomas Food Industry Register contains a good directory of food industry professionals.

UNIVERSITIES AND R+D CENTERS. Addresses of groups at universities and other research centers working in lipid related subjects, such as lipid metabolism, lipid technology, meat and dairy products, extraction and purification of oils and fats, rancidity in foods, antioxidants, food hygiene and quality, and many others. These pages contain information about projects, papers, reviews, etc. The University of Minnesota has a very good page specialized in lipids.

LIBRARY AND DOCUMENTATION. Sites edited by libraries and documentation services which allow users to consult their publication catalogues, statistical information, library directories and a great number of other connections in the food and lipid field. Many sites offer documental information about web addresses, such as The Martindale's Health Science Guide, the US Department of Agriculture page or the FAO and OMS sites.

HYGIENE AND TOXICOLOGY. Reports about microbiological and toxicological aspects of fats and fat foods, their staling and preservation. It also includes data bases reporting information about the main pathogen microorganisms and toxic substances, legal regulation and activities concerning food safety committees. Very interesting information can be found at the US Food and Drug Administration site, The National Food Safety Database, The Office of the Chief Veterinary Officer. More specific information about the control of residues in food products can be found at the site of the University of Florida, and The Oxygen Club of California site offers the most complete information about free radicals in biological systems.

FOOD TECHNOLOGY. This includes 3 different chapters: Stability and Preservation, Processes and Biotechnology and Fat Replacers. The first of these includes reports on preservation systems and conditions, the use of additives, and packing processes and materials. The second includes reports on frying process and their control, modification of the fat fraction in foods and also includes teaching material on lipid technology (Paul Singh's page is particularly interesting). It also includes reports on the biotechnological modification of fat composition in raw materials, as well as the directories of the main biotechnological centers. The Institute of Food Research page gives complete and up-dated information about biotechnological applications in fat and oil production. The third chapter includes reports on olestra and its food applications, safety and legal regulation. It contains also reports on other fat replacers and their applications. The Institute of Food Science and Technology and the Food and Drug Administration pages are the most complete in this field.

NUTRITION AND DIETETICS. Reports and guides on reducing fats in diet and on fat replacers. On-line programmes to calculate the basic metabolic rate and the nutrient supply from a diet. Reports, data bases and information about lipid metabolism and fatty acid synthesis. The International Food Information Council page gives information about physiological effects of dietary fats. The University of
Yale page includes a data base on metabolic pathways. Another interesting page on Nutrition and Dietetics is that edited by The American Dietetic Association.

HEALTH. Information about effects of consumption of different fat types and components (cancer, coronary heart disease, diabetes). Nutritional recommendations concerning fats in the diet. Reports on food habits in different populations and epidemiological significance. Food Pyramid and other dietetic guides and their applications in nutritional and health education. The most interesting page in this field is the FDA page. The Scientific and Industrial Research for Australia (CSIRO) page gives interesting and detailed information about relationships between antioxidant vitamins, lipids in the diet and disease prevention.

JOURNALS AND EDITORS. A selection of 33 addresses that give access to the main editors of journals, books and manuals, as well as direct access to a number of specialized journals. The addresses selected cover the whole field of lipid science and technology with references covering subjects from fat and oil composition data, technology of fats to nutritional, toxicological and health repercussions. In most cases summaries of articles are available and, in some cases, the whole article. Many of the editors include additional electronic services. One of the most interesting pages in this chapter is The American Oil Chemists Society page.

STANDARDIZATION AND LEGISLATION. These addresses provide access to Spanish and international institutions working in the standardization and/or legislation of fats and oils (BOE, DOGC, CODEX, SO, etc). Also included are associations and institutions that accredit or certify products or enterprises/organizations (AENOR, LGAI, AOAC, etc). The Foodnet Canada page is very interesting since it compiles up-dated food legal norms from USA and Canada. The most interesting page in this field is the CODEX page, which gives the most diversified information: reports of all the Committee meetings, data base of maximum limits of residues in foods, HACCP guidelines, labelling guidelines, etc. The FDA and AAFC pages are also interesting in the field of food labelling.

QUALITY CONTROL AND ANALYSIS. This includes 30 addresses of interest for food analysts. First, there are addresses of the main suppliers of material, reagents, standards and other laboratory instrumentation, which enable users to obtain information, catalogues and to order via Internet. Some organizations’ pages also give information about analytical methodology, validation procedures and teaching material.

CHEMISTRY AND COMPOSITION. This includes three chapters. First, there is a chapter dealing with food composition, which includes scientific reports and on-line data bases, which can be downloaded from your own PC. The main pages in this field are the databases given by the USDA and the Swiss Food Composition Database. A second chapter includes specific pages on lipid composition, dealing with essential fatty acids, n-3 fatty acids (EPA and DHA), liposoluble vitamins, carotenoids, sterols, etc. Some of these pages give very complete and detailed information about individual components, such as the Trans Fat Info Web (trans fatty acid structures, presence in food, consumption, etc). The third chapter includes information on specific fatty foods, such as fish, nuts, meat products, milk products, and other manufactured products.

Different aspects have been considered ranging from nutritional composition to technologies of elaboration or consumption and production statistics. Obviously, a large number of addresses (23) deal with edible oil and fat composition and production.

4. CONCLUSIONS

The scientific and technical information available on Internet is not subjected to the analysis of editorial committees. For this reason, the reputation of the institution/organization that edits the web page is perhaps the most important reference we have. In fact, this criterion is very useful for filtering the large volumes of information available in any field and was one of the most important in designing our page. However, this lack of such committees makes Internet a more dynamic tool and facilitates the up-dating of information on a web page. In this way, the communication between teams working on similar projects is greatly enhanced without their having to attend meetings or congresses. In contrast, in relation to methods need and results obtained, a considerable problem is still to be overcome: namely the confidentiality of Internet data. Internet has also become the most powerful way of accessing bibliographies (library catalogues, electronic journals consultation, etc) and material resources (purchase of equipment, standards and reagents, documents and books, raw materials, software, etc). However, perhaps the most important aspect of Internet is the possibility it provides of making on-line database consultations and immediate exchange of information. The future development of Internet will allow users to access more easily and more rapidly to the above mentioned resources, but it also will require the development of efficient mechanisms to evaluate and filter the scientific and technical information. Furthermore, it will require users to be more critical with information in all cases. Finally, the number of web pages appearing on the Internet grows each
day as the software becomes cheaper and more simple to use.

BIBLIOGRAPHY


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Aceptado: Julio 2000

ANNEX 1

ANALYSIS AND QUALITY CONTROL

American Chemical Society
American National Standards Institute (ANSI): ANSI Catalog
American Society for Testing Materials
AOAC: Methods validation and technical programs
Chemexpert
Chemical Analysis Zorbax HPLC Columns
Chrompack
J&W Scientific
National Institute of Standards and Technology
Sigma-Aldrich
The American Oil Chemists Society: AOCS Methods
U.S Pharmacopeia
University of Akron: Dept. of Chemistry: The Hardy Research Group: The Virtual Classroom

Food Safety and Toxicology

Agency for Toxic Substances and Disease Registry:
Cornell University: Pesticide Residues and Environmental Contaminants.
Institute of Food Research (IFR): Science at IFR: Cut microbiology and health
Ministry of Agriculture, Fisheries and Food: Department of Health: Food Safety: Guidance the food safety Regulations 1995
Office of the Chief Veterinary Officer
Oxygen Club of California
Oxygen Society
The Eduzone: Oxidative Rancidity
The National Food Safety Database:
U.S Food and Drug: Administration Food Imports: Imports Alerts
U.S. Food and Drug Administration Centre for Food Safety and Nutrition
University of Florida: Residues Methods Database
University of Iowa: Food Microbiology: Section I and II
University of Nebraska: The Food Safety webside: Foodborne illnesses
University of Purdue: Publications: Retail food safety (Issue 1)

Recibido: Diciembre 1999
Aceptado: Julio 2000
Wisconsin Center for Dairy Research: [http://www.cdr.wisc.edu/Home.html]

**FOOD TECHNOLOGY - Fat replacers**

American Dietetic Association (ADA): Hot Topics [http://www.eatright.org.]
American Heart Association: Olestra [http://www.amhrt.org/]
Calorie Control Council [http://www.caloriecontrol.org]
Canola Council of Canada [http://www.canola-council.org]
Frito lay [http://www.fritolay.com/]
Institute of Food Science and Technology (IFST): Olestra [http://ificinfo.health.org/index7.htm]
International Food Information Council: Fat-Replacers [http://www.olean.com/]
Ohio State University: Olestra [http://www.acces.spo.gov/sudoc/acces/acces140htm]
OREAN [http://www.orean.com/]
U.S. Food and Drug Administration Centre for Food Safety and Nutrition: Areas programs: Food additives and Premarket approval: Olestra backgrounder [http://www.cfsan.fda.gov/list.html]
University of Oregon: Low fat products, fat replacers, fat substitutes, reduced fat [http://www.orst.edu/food-resource/index.html]
University of Vermont: Olestra [http://www.uvm.edu/]

**FOOD TECHNOLOGY - Preservation and stability**

Foodservice & Packaging Institut: Product directory [http://www.fpi.org/proddirtoc.html]

**FOOD TECHNOLOGY - Technical processes and biotechnology**

Agriculture and Agri-Food Canada: AGTRAN [http://www.agr.ca/research/agtran/agt_ole.html]
Agriculture and Agri-Food Canada: ICAR [http://www.agr.ca/icar/icarhome.html]
Foodnet Canada: Biotechnology [http://foodnet.fc.ca/biotech/farm2.html]
Genox Corporation [http://www.genox.com/]
Institute of Food Research (IFR): Science IFR: Materials and Ingredients/Gene Technology for Food Quality [http://www.ifr.nimrc.ac.uk/buscom/ar96/]
Instituto de Biotecnologia de Granada [http://aggranados.ugr.es/biotech.htm]
Paul Singhs On-line Food Engineering Teaching Course. [http://nachos.engr.ucdavis.edu/~rpsingh/index.html]
Seedoil Modification Group [http://www.bbi.nrc.ca/seedoil.htm]
University of Guelph: Office of research: Happiness up milk fat down. [http://www.uoguelph.ca/Research/]
University of Illinois: Food Equipment [http://www.aces.uiuc.edu/~foodlab/equip/]
VTT Biotechnology and Food Research: Biotechnology [http://www.vtt.fi/bel/bio/index.htm]

**HEALTH**

American Dietetic Association (ADA): Nutrition Surrey [http://www.eatright.org/]
American Dietetic Association (ADA): [http://www.eatright.org/]
American Heart Association: Dietary Guidelines For Healthy American Adults [http://www.amhrt.org/]
Calculate the cardiovascular risk of your patients calculator [http://www.hbroussais.fr/Scientific/]
CSIRO Division of Human Nutrition: Factsheets "Antioxidants and Coronary Heart Disease" [http://www.dhn.csiro.au/radio2.html]
Department of Pathological Biochemistry in Glasgow [http://www.gla.ac.uk/Acad/PathBio/lipidresearch.html]
National Cattlemen's Beef Association: Eating in American Today
http://www.beef.org/

The Surgeon of the Public Health Service. Health and Nutrition:
http://www.mosptlight.org/media/reports/

Trans Fat Info Web Page: The USDA Prespective on fats and oil 3 Decades ago.
http://www.enig.com/0001115html

Trans Fat Info Web Page: Fat Consumption
http://www.enig.com/0001113.html

Trans Fat Info Web Page: The Industrial Revolution for fats and oils began 1910
http://www.enig.com/0001112.html

Trans Fat Info Web Page: Food Fat Production and Eating Habits in late 1800s
http://www.enig.com/0001111.html

U.S Department of Agriculture Food and Nutrition Information Center: Food guide pyramid information.
http://vm.cfsan.fda.gov/~lrd/con0695.txt

U.S Department of Agriculture Food and Nutrition Information Center: Information produced by other USA agencies: Dietary guidelines for americans
http://vm.cfsan.fda.gov/~dms/nutguide.html

U.S Department of Agriculture Food and Nutrition Information Center: Healthy eating index
http://vm.cfsan.fda.gov/~dms/fdspdiet.html

U.S. Food and Drug: Alternatives to high-fat foods (FDA)
http://vm.cfsan.fda.gov/~dms/wh_toc.html

U.S. Food and Drug Administration Centre for Food Safety and Nutrition: Information about nutrition: Women and nutrition.
http://vm.cfsan.fda.gov/~dms/fdafiber.html

U.S. Food and Drug Administration Centre for Food Safety and Nutrition: Information about nutrition: Backing up fiber is healthful regulation.
http://vm.cfsan.fda.gov/~dms/ldapound.html

U.S. Food and Drug Administration Centre for Food Safety and Nutrition: Using the food label: To loss weight
http://vm.cfsan.fda.gov/~lrd/cons1194.txt

U.S. Food and Drug Administration Centre for Food Safety and Nutrition: Using the food label: To cope with diabetis
http://vm.cfsan.fda.gov/~dms/fdheart.html

University of Texas: Fat intake continues to drop, veggies

University of Vermont: Vit E and Coronary heart disease
http://www.uvm.edu/~dklun/237pap.htm

INDUSTRIES

American Meat Institute: At Your Service
http://www.meatami.org/svc.htm

Asociación de Industrias de la Carne de España (AICE): Sector Cárnico
http://sun20.cestel.es/aice/

Food and Drink on Line
http://www.foodanddrink.co.uk/

National Cottonseed Products Association: Directory of Manufacturers and Suppliers of Cottonseed
http://www.cottonseed.com/feedprod.htm

National Oilsseed Procecssors Associations (NOPA): Exporters Guide
http://www.oilseeds.org/nopa/Exporter.html

The American Oil Chemists Society: AOCS Online Buyers Guide
http://www.aocs.org/obgmain.htm

The Food Marketing Institute: Food Industry information:
http://www.fmi.org/industry/mcl/index.html

Minority Vendor listing
http://pufa.co.net/industry.html

The University of Minnesota Omega 3 and 6 News On Line: Industry
http://www.tfr.com/

Vitamin Express
http://www.vitaminexpress.com/

JOURNALS AND PUBLISHERS

American Chemical Society: Publications
http://pubs.acs.org/new/newindex.html

American Journal of Clinical Nutrition
http://www.faseb.org/ajcn/

American Society for Clinical Nutrition
http://www.faseb.org/ascn

American Society for Nutritional Sciences
http://www.nutrition.org/

AOAC: Publications
http://www.aocac.org/pubs/pubshp.htm

Clinical Nutrition and Metabolic Care
http://www.lrpub.com/

CSIRO Division of Human Nutrition: Publications
http://www.dfs.csiro.au/

Elsevier Publications
http://www.elsevier.nl

European Journal of Clinical Nutrition
http://www.stockton-press.co.uk

Food and Agricultural Immunology
http://www.bdt.org.br/bioline/ri

Food Chemistry
http://www.elsevier.nl/iaa/pubs/chempl.html

Food Microbiology
http://www.hbuk.co.uk/ap/journals/fm/

Food Science and Technology
http://www.hbuk.co.uk/ap/journals/fs/
INFOODS: Journal of Food Composition and Analysis
Institute of Food Research (IFR): Publications
Institute of Food Science and Technology (IFST): Journals
Instituto de la Grasa de Sevilla: Publicaciones: Grasas y Aceites
Nature
New England Journal of Medicine
Nutritional Medicine
Oxygen Society: Free Radical Biology and Medicine
Royal Veterinary & Agricultural University: Food Technology
The American Oil Chemists Society: Journal of the American Oil Chemists Society
The American Oil Chemists Society: Lipids
The American Oil Chemists Society: AOCS Press and Publications
The American Oil Chemists Society: Inform
The British Medical Journal
The Journal of Nutrition
The Lancet
http://www.ifrn.bbsrc.ac.uk/BUSCOM/publications/
http://www.easynet.co.uk/ifst/
http://www.ig.csic.es/revisi.htm
http://www.nature.com
http://www.nejm.org
http://www.bdt.org.br/bioline/nm
http://newton.foodsci.kvl.dk
http://www.aocs.org/jaocs.htm
http://www.aocs.org/lipds1.htm
http://www.aocs.org/press1.htm
http://www.aocs.org/itoc997.htm
http://www.bmj.com
http://www.nutrition.org/
http://www.thelancet.com/
http://www.csic.es/publicu/
http://www.cindoc.csic.es/
http://www.chipsbooks.com/
http://www.fao.org/LIBRARY/DEFAULT.HTM
http://foodnet.fic.ca
http://www.ift.org
http://www.iata.csic.es/
http://ifificinfo.health.org
http://dialogselect.com/
http://www.lfra.co.uk/lfra/database.html
http://www.voeding.tno.nl/_fnic/software/software.html
http://www.nal.usda.gov/fnic/pubs_and_db.html
http://www-pll.who.ch/
http://www.eaynet.co.uk/ifst/mailnews.htm
http://www.nalusda.gov/fnic/pubs_and_db.html
http://www.enig.com/0001t1a.html
http://www.aoccs.org/jaocs.htm
http://www.aoccs.org/lipds1.htm
http://www.aoccs.org/press1.htm
http://www.aoccs.org/itoc997.htm
http://www.bmj.com
http://www.nutrition.org/
http://www.thelancet.com/

LIBRARIES AND DOCUMENTATION
Agriculture and Agri-Food Canada: AAFC Publications
Canadian Institute of Fisheries Technology: Library
CSIC: CSIC: Servicio de publicaciones
CSIC: CSIC: Servicio de Documentación
Chipsbooks: Oils and Fats
FAO: Library
Foodnet Canada:
Fuent de Estadísticas: Estadísticas Nutricionales
Healthlink: Supplement Library
Institute of Food Science and Technology (IFST): Inform
Institute of Food Technology
Instituto de Agroquímica y Tecnología de Alimentos: Servicio de Documentación i Biblioteca
International Food Information Council
Knight-Ridder Information-Science Base
Leatherhead Food Research Association. UK.: Databases
Foodline.
Martindale’s Health Science Guide
TNO Nutrition of Food Research: TNO Corporate
U.S Deparment of Agriculture Food and Nutrition Information Center: Food and nutrition information center publications and databases
World Health Organization: Finding information at WHO
http://www.agr.ca/csb/pub/intr.5238.html
http://www.tuns.ca/
http://www.csic.es/publici/
http://www.cindoc.csic.es/
http://www.chipsbooks.com/
http://www.fao.org/LIBRARY/DEFAULT.HTM
http://foodnet.fic.ca
http://www.ift.org
http://www.iata.csic.es/
http://ifificinfo.health.org
http://dialogselect.com/
http://www.lfra.co.uk/lfra/database.html
http://www.voeding.tno.nl/ fnic/software/software.html
http://www.nal.usda.gov/fnic/pubs_and_db.html
http://www-pll.who.ch/

LIPID CHEMISTRY AND FOOD COMPOSITION - Food composition
COST-99/EUROFOODS: Research Action on Food Consumption and Composition Data
First Databank Nutrition Products
INFOODS: Base de dades
Nutribase
Swiss Food Composition Database
U.S Department of Agriculture Food and Nutrition Information Center: Nutrient Data Laboratory
University of Illinois: Nutrient Analysis Tool
University of Texas: Nutrición Humana WEB
http://food.ethz.ch/cost99/
http://www.firstdatabank.com/
http://www.nutribase.com
http://www.nal.usda.gov/fnic/foodcomp/
http://www.ag.uiuc.edu/~food-lab/nat/
http://spin.com.mx/~jledesma/

LIPID CHEMISTRY AND FOOD COMPOSITION - Lipid compounds
Institute of Food Science and Technology (IFST): Trans Fatty Acids
Nordic Naturals Omega 3 and Pro Omega Related Research
The University of Minnesota Omega 3 and 6 News On Line
Trans Fat Info Web Page: Health Issues and Trans fat
http://www.nordicnat.com/proomega.htm
http://pufa.co.net/
http://www.enig.com/00011a.html
LIPID CHEMISTRY AND FOOD COMPOSITION - Specific foods

Agriculture and Agri-Food Canada: Database
http://www.agr.ca/dbse.html

Agriculture and Agri-Food Canada: Animals Poultry Layer
http://www.agr.ca/misb/aisb/poultry/

American Egg Board: Fowl & Poultry Science
http://www.aeb.org/

American Lamb Council
http://www.sheepusa.org/

American Meat Institute
http://www.meatami.org/

American Soybean Association
http://www.oilseeds.org/asa

Asociación de Industrias de la Carne de España (AICE):
http://sun20.cestel.es/aice/aice.html

Asociación de Industrias de la Carne de España
http://www.cbef.com/

University of Guelph: Meat Science:
http://www.aps.uoguelph.ca/~swatland/gasman.html

University of Texas: Meating place
http://www.mtgplace.com/

University of Texas: Food Science and Technology Animal Science
http://savell-j.tamu.edu/ansc307h.html

USDA New Crops Research
http://www.cncaur.usda.gov/nc/nchome.htm

NORMALIZATION AND REGULATIONS

Agriculture and Agri-Food Canada: Acts and Regulations
http://www.agr.ca/lawse.html

Agriculture and Agri-Food Canada: Guide to food labelling and advertisement
http://www.cfra-acia.agr.ca/english/food/label/home.html

Asociación Española de Normalización y Certificación (AENOR)
http://www.aenor.es/

Boletín Oficial del Estado
http://www.boe.es/

Codex Alimentarius
http://www.faohq.org/waext/boe/index.html

Diario Oficial de la Generalitat de Catalunya
http://www.gencat.es/diari/

Foodnet Canada: Food Regulations
http://foodnet.fic.ca/

International Food Information Council: International Food Regulation
http://ificinfo.health.org/index15.htm

International Organization for Standardization
http://www.iso.ch/

Laboratori General d’Assaigs i Investigacions
http://www.lgai.es/

Ministry of Agriculture, Fisheries and Food: Information on Food
http://www.maff.gov.uk/food/foodindex.htm

U.S. Food and Drug Administration Centre for Food Safety and Nutrition: Questions and answers: Food labelling
http://vm.cfsan.fda.gov/~dms/qa-top.html

U.S. Food and Drug Administration Centre for Food Safety and Nutrition: Food labelling, nutrition and dietary supplement information: overview of the next food label.
http://vm.cfsan.fda.gov/~ird/newlabel.html