

SCHOOL OF PUBLIC HEALTH AND COMMUNITY MEDICINE
NUTRITIONAL SCIENCES PROGRAM
SELF-STUDY

I. Context

A. Name of unit authorized to offer degrees - *Nutritional Sciences Program*

B. School or college(s) - *School of Public Health and Community Medicine*

C. Exact title(s) of degrees offered - *PhD, MS, MPH, Dietetic Internship (RD-eligible)*

D. Brief description and history of Nutritional Sciences at the University of Washington - Nutritional Sciences has been an active discipline at the University of Washington since the early part of this century. During the early 1980's, as a result of a serious financial emergency, the School of Nutritional Sciences was one of the programs targeted for elimination by the Dean of the College of Arts and Sciences. After intense review, it was recognized that the discipline of nutritional sciences was a necessary component of the university. Thus the Interdisciplinary Graduate Program in Nutritional Sciences was organized in 1984, administered by the Graduate School. Although the undergraduate degree program was eliminated, undergraduate courses were retained to service the School of Nursing and to meet undergraduate science distribution requirements. Meanwhile, the graduate program was enhanced with the addition of an interdisciplinary doctoral program in nutritional sciences, approved in 1988, along with a graduate level Dietetic Practicum Program, currently the Dietetic Internship Program. In 1993, the Interdisciplinary Graduate Program in Nutritional Sciences joined the School of Public Health and Community Medicine (SPHCM). The Department of Epidemiology now administers the program while the director of the Nutritional Sciences Program provides the day-to-day supervision.

Rapid developments in the field, combined with strong public interest and the increasing recognition of its role in disease prevention and treatment, require that attention to nutritional sciences be aggressively maintained. It encompasses a variety of approaches from molecular biology, genetics and bench science on the one extreme to clinical nutrition therapy and public health assessment/intervention on the other. Accordingly, the Nutritional Sciences Program includes faculty with expertise in these diverse areas, whose common goal is to improve the health of the public.

II. Unit Roles And Responsibilities

Organization. The organizational structure of the program includes a core faculty and the extended interdisciplinary group faculty (see Appendix I). The **core faculty**, composed of ten members, has primary responsibility for teaching nutrition courses, program planning, and advising students. Core faculty members have appointments in various departments at the University of Washington, including three departments within the SPHCM: Epidemiology, Health Services, and Pathobiology; and two departments within the School of Medicine: Medicine and Pediatrics. These affiliations facilitate interdisciplinary collaborations among faculty with diverse research and professional interests.

The **interdisciplinary group faculty** supports and extends the core faculty by guest lecturing in nutrition courses, offering research opportunities to graduate students, providing input on curricula and policy changes, and serving on PhD/MPH/MS student supervisory committees. The interdisciplinary group faculty is composed of 54 members.

A. Principal roles

The mission of the program in nutritional sciences is to promote better health and prevent illness through increasing the understanding of nutritional science, and to carryout the university's broad mission of teaching, research, and service (see Appendix F). The principal roles and activities of the Nutritional Sciences Graduate Program:

TEACHING

Graduate education. The program provides graduate level education leading to three academic degrees: PhD and MS in nutritional sciences and MPH in nutrition. Students entering either the Master's or Doctoral graduate program may specialize in one of three major tracks for research and study: **experimental nutrition, clinical nutrition, and public health nutrition.** Brochures describing our academic degree programs are provided in appendix I.

Professional education. The program offers a Dietetic Internship Program that is accredited by the American Dietetic Association (ADA), and is part of a continuing tradition of dietetic education in our program. Students in the Dietetic Internship Program work simultaneously toward completion of a

master's degree. Upon completion of the Internship Program, students are eligible to take the ADA's national registration examination to become registered dietitians.

Continuing education. The program individually and jointly sponsors continuing professional education programs for registered dietitians and other nutrition and health care professionals and scientists. Recently the program co-sponsored the Northwest Regional Symposium on Prenatal, Infant and Child Nutrition, and continues to be the principal sponsor of the Washington State Dairy Council Nutritional Sciences Visiting Professor Program. In addition, the faculty participate in continuing education programs as members of planning committees and as invited speakers. Faculty members also cooperate with many other specialized faculty groups to provide continuing education in areas where nutrition is an integral part of comprehensive health care, such as cardiology, oncology, and pediatrics. Thus, faculty organize and participate in continuing education experiences that include local, state, regional, national, and international venues and entities. Please see core faculty curriculum vitae (CV) for further details (Appendix H).

RESEARCH

Research. Research is fundamental to the advancement of the field of nutrition. Our program faculty is active in the areas of experimental, clinical, and public health nutrition research. Our program is particularly strong in research areas such as: lipid metabolism, nutrition in the etiology and the treatment of cancer and cardiovascular disease, nutrition and genetics, eating disorders, iron metabolism, maternal and child health, dietary intervention studies, folic acid in health and disease, and nutritional epidemiology. The faculty frequently participate in international, national, and regional research conferences, and submit scientific reports for publication. Several faculty members are active members or affiliates in research institutions in this area, including the Fred Hutchinson Cancer Research Center (FHCRRC), the Northwest Lipid Research Center (NWLRC), the Clinical Research Center (CRC) at the University of Washington Medical Center, and the Clinical Nutrition Research Unit (CNRU). In addition, all students in the program conduct research as part of their degree requirements, and graduates of the program are urged to submit abstracts to professional and scientific meetings and articles to scientific journals for publication. See

appendix J for research projects and recent publications, appendix K for a listing of current and pending research.

Scholarly. The program houses the editorial offices of the Journal of the American Dietetic Association (JADA), and its' editor is a member of our core faculty. The program faculty provides expert scientific review for a variety peer-reviewed journals and professional publications and serve on editorial boards of scientific journals. Members of the faculty publish invited reviews and chapters in leading scientific journals and books. See faculty CVs for details of scholarly activities (Appendix H).

SERVICE

Service. The program faculty participates in university committees (e.g., Human Subjects Review Committees, Faculty Senate, Faculty Council on Facilities and Services) and supports university activities with faculty and student contributions, such as at the Health Sciences Center Open House. Dietetic Interns participate in the biannual Health Sciences Fair each year and provide supervised medical nutrition therapy to patients at university teaching hospitals. Faculty also present guest lectures for courses offered to students outside the SPHCM, including courses in the Schools of Nursing, Medicine, and Dentistry. The program serves as a regional resource of nutrition information for the media, and frequently answers questions about nutrition for individuals, professionals, and other groups in the community. Faculty and students speak at community events, such as meetings of the Retired Faculty Association, the local chapter of the American Cancer Society (ACS), La Leche League, various student groups, and local elementary and high schools. At regional and national levels, faculty routinely hold elected posts in scientific organizations, and participate in committees and conferences (e.g., American Society of Clinical Nutrition (ASCN), American Societies of Nutritional Sciences (ASNS), ADA, Society for Epidemiologic Research (SER), Society for Nutrition Education (SNE), Washington State Dietitian Association (WSDA), American Heart Association (AHA)). Faculty serve on editorial boards of scientific journals (JADA, Journal of Lipid Research (JLR), American Journal of Public Health (AJPH)), and provide peer review for manuscripts submitted to various scientific and professional journals (e.g., American Journal of Clinical Nutrition (AJCN), JADA, American Journal of Epidemiology (AJE), JLR, AJPH, Circulation, Science, Atherosclerosis, Thrombosis and Vascular Biology, Journal of National Cancer Institute (JNCI), Trends in

Cardiovascular Medicine). Members of the faculty serve on grant review committees for the National Institutes of Health, AHA, Juvenile Diabetes Association (JDA), the Veterans Administration, and other funding agencies. Specific examples may be found in faculty CVs (Appendix H).

Consultation. The program provides faculty for consultation in nutritional management, policy, and research for individuals, corporations, community agencies, and professionals. For example, members of the faculty advise professionals concerning design, conduct, and analysis of clinical dietetics and nutrition research in medical facilities in this region. Faculty provide consultation on maternal and child health program and policy development and assurance of services to local and regional public health (MCH) programs, group homes, and providers of services to children with metabolic disorders or other special health care needs. As part of the Regional Genetics Center, members of the faculty provide consultation to physicians and other community health providers via MedCon. The program assists investigators both in the university and the community by providing consultation regarding publication of research and professional practice articles. Members of the faculty consult for scientific journals (see above), and health agencies and service foundations, such as the ACS, the AHA, the JDA, and the Centers for Disease Control and Prevention (CDCP). Faculty are called by the public, other professionals in health care, and members of industry for consultation and advice on food and nutrition issues. Please see faculty CVs for other specific examples of consultation (Appendix H).

Sharing knowledge collectively generated within the academic system is considered by the program to be a contribution of its faculty to university outreach and, as such, consultative activities are usually without cost to the recipient or are supported by grants with mandates to provide consultation. Token honoraria or reimbursement for expenses may be accepted, as guided by university policies.

B. Opportunities the roles provide.

TEACHING

Teaching. As the result of collaboration in teaching facilitated by the interdisciplinary aspect of our program, we have developed strong ties with several other graduate and undergraduate degree programs, such as Food Science and Fisheries (FS 300/NUTR 300) and Nursing (NUTR 301), where nutrition courses have been cross-listed and have been used to fulfill the undergraduate science requirement. Since 1989 we

have offered a course in Nutritional Epidemiology (NUTR 538/EPI 538), which is cross-listed in both programs.

Because of the interdisciplinary nature of nutritional sciences, our graduate courses are applicable to most other fields in the biomedical sciences. For example, the study of nutrition can be approached from many perspectives: molecular, cellular, genetic, physiological, agricultural, epidemiologic, clinical, anthropologic, and community. Thus, students from these other disciplines have enrolled in our courses and some have even taken sufficient credits to constitute a minor, or have chosen to transfer into our program. Emphasizing the critical relevance of nutritional sciences to other scientific fields, including newly emerging ones, we developed a new course, Nutrition and Gene Expression (NUTR 551) which integrates nutritional science and genetics. We are also exploring some common interests with faculty in the Department of Anthropology and expect that a course in Nutritional Anthropology (BIO A 465) could be cross-listed with our program.

The collaboration between the program and the Center for Human Development and Disability (CHDD) enhances teaching and gives nutrition graduate students the opportunity to participate in special healthcare traineeships. This collaboration made possible a specialized and timely course offering, Nutrition for Children with Special Health Care Needs (NUTR 530). The LEND training grant (Maternal and Child Health Interdisciplinary Leadership Education for Health Professionals Caring for Children with Neurodevelopmental and Related Disabilities) provides a stipend for a nutrition graduate student for leadership training. The Adolescent Training Program supports a long-term trainee in Adolescent Health Nutrition. Additional trainees in nutrition are supported as they work with the long-term intervention model for the treatment of chronic disorders.

RESEARCH

Research and scholarly. All areas of the program's research efforts benefit from collaboration and cross-fertilization of ideas that the interdisciplinary nature of our program fosters. Current experimental research being conducted in our laboratories primarily focuses on links between nutrition and diabetes, cardiovascular disease, inflammatory diseases, cancer, Alzheimer's disease, bone metabolism, eating disorders, and maternal/child nutrition. This has resulted in collaborations with faculty, graduate students,

and fellows in the departments of Pathobiology, Epidemiology, Medicine, Pathology, and Surgery, as well as the FHCRC and the Veterans Affairs Puget Sound Health Care System (VAPSHCS). Ongoing clinical research by core faculty and graduate students in areas such as fetal distress syndrome, renal failure, AIDS, cardiovascular disease, neonatal nutritional care, cancer, and congenital neural tube defects has fostered strong collaborative ties with researchers at the CHDD, Children's Hospital and Medical Center, University of Washington Medical Center (UWMC), Harborview Medical Center (HMC), the CNRU, Swedish Hospital and Medical Center, the Clinical Division of the FHCRC, Bailey Boushey House, Madison Clinic, the NWLRC, and the Northwest Kidney Center (NKC), among others. Faculty scientists involved in public health nutrition research and nutritional epidemiology collaborate with scientists in Biostatistics, Pathobiology, Health Services, Environmental Health, Medicine, Psychology and others. Current research in dietary intervention trials and folic acid, homocysteine and cardiovascular disease have placed students with scientists at the FHCRC's Division of Public Health Sciences, Group Health Cooperative of Puget Sound, and faculty in Medicine and Medical Genetics. Funding for this research has come from the National Cancer Institute, the National Heart, Lung and Blood Institute, and the CDCP. All research projects have opportunities for student research assistantships and thesis or dissertation projects. A number of students are working with public health agencies such as WIC, the Senior Nutrition Centers, El Centro de la Raza, and food distribution systems such as Second Harvest, Northwest Harvest, and Chicken Soup Brigade.

Opportunities for research have also come from outside the academic setting. Members of the core faculty have been successful at obtaining funding from private industry to support research. For example, the tea industry has provided funds for laboratory studies of the effects of antioxidants in black tea on lipoprotein oxidation and atherosclerosis. These funds also support nutrition graduate students. The Campbell Soup Company has funded studies of the effects of antioxidant supplementation of vegetable juice on several metabolic parameters. These funds provided full-time employment to a nutritional sciences doctoral student. Smith Kline Beecham Company awarded a core faculty member an unrestricted gift to do some targeted research. These funds provided partial support for research conducted by a nutritional sciences post-doctoral fellow. It should be noted that in all cases, there have not been

restrictions placed on publication or presentation of research results by the companies involved in these collaborative arrangements. We will further our collaboration with private industry to augment the research funded by NIH and CDCP.

Nutritional Sciences Program faculty in the CHDD have taken advantage of opportunities for research and training unique to that setting. The faculty are active in designing, implementing, and evaluating protocols for the population of children with special health care needs. This has also provided opportunities for our graduate students to participate in traineeships and interdisciplinary research projects with the team of clinical scientists at CHDD. Examples of projects that involved students or currently do are: a nationwide 23-center assessment of long-term outcome in maternal phenylketonuria and a collaborative project with the Prader Willi Parents Organization.

SERVICE

Service and consultation. Our service activities have increased exposure of the program to the community and region has led to occasional donations of funds and supplies to the program by individuals who have benefited from consultation and advice. Service activities increases collaboration with regional and national experts, who can periodically provide lectures and seminars on our campus. Our program's recognition also broadens the opportunities for student research and experience in community settings. The increased exposure helps to attract applications from exceptional students from the region and beyond.

C. Differences between our view of our role and the university expectations

We strived to excel at all roles designated by our unit. Traditionally, however, we placed a higher priority on the role of teaching and graduate and professional education than on other roles. Since our recent move to the SPHCM, we are in the process of increasing emphasis on research, while maintaining a quality teaching program. This difference in role emphasis has created challenges in modifying curricula that meet the academic requirements while using the available faculty and financial resources efficiently. These challenges have been exacerbated by the prolonged delays in replacing retiring faculty members (see Section II.D.). Besides the plans already in place to fill existing faculty vacancies, we are resolving these difficulties by three main approaches. First, we are evaluating program degree requirements and courses offered to utilize existing courses in the SPHCM and other university units to meet degree requirements as

well as consolidating courses offered by the program that are no longer feasible to offer alone. It has helped to offer some courses on an every-other-year basis. Second, we are making plans to expand the core faculty by inviting selected members of the existing interdisciplinary group faculty to join, which would allow the distribution of teaching and academic functions to be shared among a larger number of faculty. Third, we will involve the interdisciplinary group faculty more extensively in teaching and mentoring roles with students, including providing research opportunities, which will further share academic responsibilities and allow greater breadth of expertise to be available to students.

Another key strategy for increasing the program's research base will be to recruit a strong researcher as the program's next director. All three of the final candidates clearly qualify. Enhancing the role of the interdisciplinary group faculty could also contribute to the strength and breadth of the research base.

D. Changes and pressures that have influenced the unit's role.

Changes in the field. A number of changes have occurred in the field of nutrition over the last decade that have influenced our program. Perhaps most important among these is the **increasing recognition of the role of nutrition in health promotion and disease prevention.** The importance of nutrition in public health has been reflected in major public health documents, including: *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention* (DHEW [PHS] publication no. 79-55071, 1979); *The Surgeon General's Report on Nutrition and Health* (DHHS [PHS] publication no. 88-50210, 1988); *Diet and Health: Implications for Reducing Chronic Disease Risk* (National Academy of Sciences, 1989) and *Healthy People 2000: National Health Promotion and Disease Prevention Objectives* (DHHS [PHS] publication no. 91-50213, 1990). These reports have stimulated a number of randomized controlled trials to evaluate methods to change dietary behavior consistent with the guidelines and recommendations. These have included randomized intervention trials both on the individual and community level to reduce dietary fat intake, and increase consumption of fruits, vegetables, and whole grains. These documents highlight the importance of nutrition in clinical and public health applications and parallel a dramatic growth in nutrition research.

Over the decade, **medical nutrition therapy** has evolved to be a key component in the cost effective treatment of disease (JADA 95:1009-1017;1018-1024;1041-1043, 1995). Many studies involving nutrition are conducted at the CRC at UWMC and at CHDD. In addition, the CNRU became recognized as a strong force in promoting the science of clinical nutrition. The CNRU provides funding and facilities to support investigators who engage in clinical nutrition studies, and our program is closely affiliated with this unit; the director of the CNRU is on our core faculty. As a result of these influences, the interest in clinical nutrition research on campus has increased, an interest that is actively supported by our faculty and the Dietetic Internship Program. For example, many of our doctoral and master's degree students select projects that focus on clinical nutrition (see Appendix L). A large number of our faculty identify clinical nutrition research as a specialty or sub-specialty. Our program faculty collaborate with several local clinical facilities in the community, such as FHCRC, Swedish Medical Center and Providence Medical Center, in addition to UWMC and HMC, to conduct nutrition-oriented studies. We expect that clinical nutrition research will continue to be important in the field of nutrition, especially because nutrition has become a component of managed health care. Further, the demand for outcomes research and cost effectiveness research in clinical care has become priorities for health care providers (JADA 94:257-259, 1994; JADA 95:976-978, 1995). We are conducting relevant research in this area as well as educating professionals who can meet these demands.

The need for research in the area of **public health nutrition** led us to enhance our collaboration with public health scientists in the SPHCM. We include such scientists on both our core faculty and the interdisciplinary group faculty. There has been tremendous growth in research that concerns the issues of how nutrition knowledge can be translated into positive changes in the marketplace and in the lifestyle choices made by the public. Many investigations by our faculty address these issues that ultimately will lead to enhanced health of communities and groups. We also anticipate an increased demand for professionals with expertise in public health nutrition, and have added the curriculum leading to the MPH in nutrition academic degree to our program.

Another important development in the field of nutrition is the evolving discoveries of the links between **nutrition and genetic expression**, which has led to clues about how this interaction may

influence the etiology, development, and treatment of disease. In response to this change in the field, faculty in the program with expertise in experimental nutrition have thoroughly integrated techniques of molecular biology into their research, adapted their research programs to reflect the greater availability of extramural funding for research in molecular nutrition and have started to provide research opportunities to students who have strong backgrounds and interests in this area. Furthermore, the program has developed a new course focused on emerging trends in research on nutrient-gene interactions, entitled Nutrition and Gene Expression (NUTR 551). One of our core faculty is also in charge of the Nutrient-Gene Subcore of the CNRU.

Recognition of the links of nutrition with gene expression has also influenced several research projects in nutritional epidemiology. These studies are designed to further understand the metabolic process by using intermediate markers, including biomarkers of dietary intake such as the carotenoids, and research on the relationships between dietary intake and intermediate markers, controlled for genotypes of the biologic pathways.

Internal and external pressures. An important internal pressure that the program has faced is the reduced number of faculty in our program since three faculty retired in 1990-1996. Since 1994, we have conducted two national searches for two faculty positions and have encountered a number of delays in filling these positions. One applicant has recently been approved by the faculty of the Department of Health Services. If full university approval is obtained, she will join our core faculty as acting assistant professor in the near future to temporarily ease our prolonged faculty shortage. At the same time, our current program director is resigning from that position as soon as a new director can be selected. A search committee is now interviewing applicants for director of the program and we hope to have a new director appointed by the end of autumn quarter. We anticipate that the new director will make plans to permanently fill the other faculty vacancy, for which we have already received approval. The additional faculty will ease the pressure of reduced faculty, will bring new expertise into our group, and will help us address some of the changes in our field.

An important external pressure facing the program is the need to be responsive to the needs of the community for accurate information concerning the relationship between proper nutrition and disease.

Misinformation is widely disseminated by the media and by word of mouth, resulting in confusion concerning the curative and preventive roles of nutrition. We see the dissemination of accurate information as being an important way we can provide service to both the community and the university. Over the years, diminished resources in both funding and faculty make it difficult for us to be as successful in this role as our potential would allow.

With our newly appointed director, we will explore ways to maximize the use of available state funds. Though highly desirable, it is unrealistic to expect that additional faculty FTEs will become available in the near future. Plans to leverage state funds will likely include a variety of approaches, such as opening membership on the core faculty to more interdisciplinary group faculty to involve faculty that receive few or no state funds (e.g., research faculty). It may also be necessary to reallocate the few existing faculty FTEs so that more faculty can be supported at a lower level of state support per faculty member; it is hoped that this action can be done in conjunction with securing increased levels of extramural funding and program faculty are active in seeking additional research funds.

E. Criteria for success.

Key criteria used to measure success in the field of nutritional sciences and in our program include graduate career placement, student competitiveness in receiving scholarship awards, scores on qualifying examinations (e.g., ADA registration exam), publications, and grant support. We believe that our program has achieved a high level of success in all of these areas.

- Graduate career placement. All of the six graduates of our doctoral program have competed successfully for tenure-track faculty appointments at universities and colleges (3), post-doctoral positions at research institutions (2), principal investigator of NIH-funded research grant (1). Over the last five years, all of the MS/RD-eligible graduates gained employment in their field within one year of graduation. Additional details are presented in appendix E.
- Scholarship awards. Sixteen graduate students have received national awards.
- Scores on professional qualifying examinations have been consistently above average (see Section III.3.).

- Publications. The core faculty have published 149 scientific and scholarly articles and 31 professional manuscripts (e.g., technical reports) in the last five years; we have published 42 abstracts in the last two years (see Appendix J). The faculty CVs in appendix H provide a comprehensive listing of recent publications.
- Research grant support. The core faculty have received funding for 44 research projects over the last 5 years (see Appendix K). A detailed list of research funding support is found in faculty CVs (Appendix H).

F. Leadership in the field

The program is recognized as a leading academic and research unit for nutritional sciences in the areas of experimental nutrition, clinical nutrition, and public health nutrition. Specific ways in which leadership of our program is evident are:

- The editor of the JADA is a member of the core faculty and director of the program; the editorial offices are housed within the program facilities.
- Members of faculty are on the editorial boards of scientific peer-reviewed journals (e.g., AJPH, JADA, JLR).
- Members of the faculty have been invited speakers at national and international conferences (e.g., IARC Seminar, 1995; ICD Conference (Paris) 1996; ASPEN Conference, 1997, SNE Meeting, Montreal, 1997). See faculty CVs for details (Appendix H).
- Faculty are asked to serve on research review committees of NIH and other funding agencies (e.g., AHA, Juvenile Diabetes Foundation, Veterans Administration).
- Faculty serve as scientific advisors for public health policy hearings (e.g., FDA, CDC, IOM).
- Members of the faculty are sought out to be reviewers for major research and professional journals.
- The Head of the Dietetic Internship Program, Joan Karkeck, was awarded the Dietetic Educator of the Year in 1995 in recognition of her leadership in dietetic education.
- Core faculty member, Michael Rosenfeld, was awarded Visiting Scientist Award by the Finnish Academy of Sciences, 1995-1996.

(Please see Appendix H for further details).

Under the leadership of our newly appointed director, we anticipate creating new strategies to further develop our potential in this area.

G. Collaboration with other institutions.

Our program participates in collaborative research and education activities with a number of institutions in this area. Many examples have been cited in the sections above. An overview of collaboration with other institutions in this region is given in table 1 (page 16).

Ties with related programs at other institutions. Faculty maintain ties with scientists at other academic institutions:

INSTITUTION	ACTIVITY
Cornell University/Cooperative Extension	Education
Kuopio University, Finland	Research
Ohio State University	Research/Education
University of North Carolina, Chapel Hill	Research
University of California, Los Angeles	Research/Education
University of Utah	Research/Education
Washington University	Research

H. Collaboration with other units at the University of Washington.

Our program collaborates with several other units on this campus, as referred to in section II B. An overview of our collaboration with programs at the university is shown in table 2 (page 17).

In the past decade, the strong interdisciplinary influence of our program strengthened the university's bid for an NIH-funded CNRU. In turn, the presence of the CNRU here, one of only five such units nationwide, has broadened collaborative resources and opportunities for our faculty and students. The CNRU links more than 80 researchers on campus who actively participate in nutrition research, despite their extremely diverse backgrounds. The CNRU's annual day-long retreat has helped to strengthen our program's bonds with other researchers and campus departments, and to stimulate shared creativity in research. We hope to initiate other activities to foster more cross-fertilization of ideas. One plan is to

sponsor a monthly Nutritional Sciences journal club that would provide a forum in which scientists from a variety of disciplines meet to discuss current topics in nutrition and develop ideas for grant proposals.

A goal for the program is to extend collaboration with the CHDD to conduct interdisciplinary collaborative research projects. Currently, faculty and students are involved in multi-center research projects. A short list includes: the Adolescent Pregnancy Project, the Maternal PKU Pregnancy Project, Nutrition Leadership Training Project. Students have been involved in funded projects that have translated into theses. The Pacific Northwest Regional Genetics Group has funded the development of educational materials for 'new' metabolic disorders and Ross Laboratories has funded the development of curriculum for teaching self-management skills to children with metabolic disorders.

We are seeking to extend and strengthen our collaboration with other investigators who do nutrition-related research. Several faculty members are affiliate members of the National Institute of Environmental Health and Safety Center for Ecogenetics and Environmental Health, administered by the Department of Environmental Health, with the intent of broadening collaborative research in the area of dietary effects on susceptibility to environmental factors and related diseases. We are also exploring the possibility of revising structure, role, and communication with interdisciplinary group faculty. Other ideas include initiating a nutritional sciences journal club and using a regular newsletter spotlighting different areas of the program in subsequent issues.

Table 1 - Collaboration With Other Institutions in the Puget Sound Region

UNIT	INSTITUTION	ACTIVITY
Cancer Prevention Research Program	Fred Hutchinson Cancer Research Center	<ul style="list-style-type: none"> • Research • Student mentoring
Women's Health Initiative Coordinating Center	Fred Hutchinson Cancer Research Center	<ul style="list-style-type: none"> • Research • Student mentoring • Education
Women's Health Initiative Clinical Center	Fred Hutchinson Cancer Research Center	<ul style="list-style-type: none"> • Research • Student mentoring
Clinical Nutrition Department	Fred Hutchinson Cancer Research Center	<ul style="list-style-type: none"> • Research • Student mentoring
Core Laboratory for the Public Health Sciences	Fred Hutchinson Cancer Research Center	<ul style="list-style-type: none"> • Research • Student mentoring
Pediatrics Pulmonary Department	Childrens Hospital and Medical Center	<ul style="list-style-type: none"> • Research • Student mentoring
Puget Sound Oncology Consortium	Swedish Medical Center Tumor Institute	<ul style="list-style-type: none"> • Research
Policy and Research Division	National Coalition of Hispanic Health and Human Services Organizations	<ul style="list-style-type: none"> • Research
Statistical Core	Northwest Lipid Research Center	<ul style="list-style-type: none"> • Research • Student mentoring • Education
Nutrition Department	Virginia Mason Medical Center	<ul style="list-style-type: none"> • Research
Nutrition Section	Washington State Department of Health	<ul style="list-style-type: none"> • Research • Education
Immunology Department	Immunex Corporation	<ul style="list-style-type: none"> • Research
Nutrition Department	Veterans Affairs Puget Sound Health Care System	<ul style="list-style-type: none"> • Education/Practicum
Geriatric Research Education and Clinical Center	Veterans Affairs Puget Sound Health Care System	<ul style="list-style-type: none"> • Research • Student mentoring
Hematology	Madigan Army Hospital	<ul style="list-style-type: none"> • Research
Nutrition Section	Northwest Kidney Center	<ul style="list-style-type: none"> • Research • Student mentoring

Table 2 - Collaboration With Other UW Units

UNIT	DEPARTMENT/DIVISION	ACTIVITY
Nutrition Section	Center on Human Development and Disability	<ul style="list-style-type: none"> • Research • Student mentoring • Education
Research Core	Clinical Nutrition Research Unit	<ul style="list-style-type: none"> • Research • Student mentoring
Statistics Core	Clinical Nutrition Research Unit	<ul style="list-style-type: none"> • Research • Student mentoring • Education
Laboratory Core	Clinical Nutrition Research Unit	<ul style="list-style-type: none"> • Research • Student mentoring
Nutrition-Gene Subcore	Clinical Nutrition Research Unit	<ul style="list-style-type: none"> • Administration • Research • Student mentoring
Body Composition Subcore	Clinical Nutrition Research Unit	<ul style="list-style-type: none"> • Research
Neonatal Intensive Care Unit	University Medical Center	<ul style="list-style-type: none"> • Research • Student mentoring • Education
Abdominal Imaging	Radiology Department	<ul style="list-style-type: none"> • Research
Child Development	Psychology Department	<ul style="list-style-type: none"> • Research • Student mentoring
Health Psychology	Psychology Department	<ul style="list-style-type: none"> • Research • Student mentoring
Nutritional Anthropology	Anthropology Department	<ul style="list-style-type: none"> • Education
Nursing Education	School of Nursing	<ul style="list-style-type: none"> • Education • Student mentoring
Medical Student Education	School of Medicine	<ul style="list-style-type: none"> • Education
Dental Student Education	School of Dentistry	<ul style="list-style-type: none"> • Education • Research
Various faculty outside Nutritional Sciences Program	Epidemiology Department	<ul style="list-style-type: none"> • Research • Student mentoring • Education
Surgery	Medicine	<ul style="list-style-type: none"> • Research • Education
Nutrition Department	University of Washington Medical Center	<ul style="list-style-type: none"> • Education/Practicum
Nutrition Department	Harborview Medical Center	<ul style="list-style-type: none"> • Education/Practicum
Medical Genetics	Medicine	<ul style="list-style-type: none"> • Research
Gastroenterology	Medicine	<ul style="list-style-type: none"> • Research
Cardiovascular Disease RU	Epidemiology	<ul style="list-style-type: none"> • Research
National Institute of Environmental Health and Safety Center for Ecogenetics and Environmental Health	Environmental Health	<ul style="list-style-type: none"> • Research • Education

III. **Degree Programs**

Programs offered and relationship between degrees. The program offers three degrees (MS, MPH, and PhD) along with a professional training program (the Didactic Program in Dietetics and the Dietetic Internship Program). Although there is no longer an undergraduate program in Nutritional Sciences, students with science-related undergraduate degrees, who are interested in pursuing careers in nutrition may apply to our graduate program. Those who wish to become dietitians while pursuing their graduate degrees may complete prerequisite courses for the Dietetic Internship through our Didactic Program. Students who apply for either our PhD program or MS program may apply concurrently for our dietetic internship. Applicants who are registered dietitians (RDs), or are eligible to take the dietetic registration exam, may apply for our MPH program. RDs who enter our MS, MPH or PhD programs often serve as clinical teaching assistants (CTAs) and mentors for our dietetic interns. PhD students are able to fulfill teaching requirements by serving as CTAs for the Dietetic Internship or as TAs for nutrition courses.

A. **Bachelor's degrees**

N/A

B. **Master's degrees**

Master of Science degree (MS). The MS in Nutritional Science is an interdisciplinary program of graduate studies designed to provide the student with the understanding and basic knowledge of human nutrition, and the opportunity to focus advanced study in one of three principal areas of study: experimental, clinical, and public health. The curriculum also provides appropriate research experience to enable the graduate to actively participate in nutritional science in an experimental setting as well as its application in public health and clinical health care settings. Qualified students in the MS program also have the opportunity to apply for the dietetic internship. The type of student pursuing the MS degree is an individual with an undergraduate background in nutrition or a related field (e.g., biochemistry) or an individual with an RD who wishes to pursue advanced training in nutritional sciences (see Appendix G).

Objectives of the MS degree in Nutritional Sciences

- To prepare students to expand the base of knowledge in nutritional sciences and its application to public health and health care delivery settings. To this end, the MS program is designed to assist

students in gaining understanding of nutrition and metabolism and of related biological, biochemical, molecular, epidemiological, and behavioral sciences, and in acquiring research skills.

- To provide training in advanced human nutrition and its applications to the field, including basic science, public health, and clinical dietetics, through both didactic and applied experiences in laboratory, clinical or public health settings.
- To provide an opportunity for advanced study of a particular topic in experimental, clinical, or public health nutrition through thesis research.
- To provide additional research experiences that enable students to gain skills necessary to participate in scientific investigations and to pursue further academic education (PhD).

Following completion of the MS degree in nutritional science, the graduate will be able to:

- Accurately describe human nutrient requirements and their relationship to metabolism and physiological function.
- Determine the nutritional status of individuals and groups.
- Relate pathophysiological changes to alterations in nutritional status.
- Participate in scientific investigation of topics related to nutritional sciences.
- Provide leadership and management in the provision of nutritional care services for individuals and groups.
- Assist in policy development and evaluation.
- Design effective and appropriate nutritional education programs for individuals and groups.

Benefits of the MS degree in nutritional sciences to the academic unit, the university and the region. The MS program benefits our Nutritional Sciences Program in several ways. First, the MS program prepares highly qualified graduates who may go on to enter the PhD program and make significant contributions to the field of nutrition. Second, the MS program shares with the PhD program many nutritional sciences courses, increasing the efficiency of varied course offerings available to our students. Third, the MS program recruits a large number of dietetic professionals whose clinical experiences contribute to classroom interaction. And fourth, the MS program allows an wide diversity of interests and research

projects to be pursued, including small, interesting projects that dovetail with larger investigations, but do not require the same level of originality and independent work as that of the PhD program.

The MS program contributes to the university by providing a training program for nutrition professionals who interact with other health sciences students, sharing knowledge and expertise in nutrition. The MS students collaborate with established scientists at the university and professionals in the community to assist them with scientific and clinical projects; MS thesis projects routinely address everyday clinical and public health problems for institutions and agencies in the community, as well as developments in experimental nutritional science. Graduates of the MS program receive training that prepares them to productively serve the health of individuals and of the community.

Standards used to measure success in achieving the objectives of the MS degree. The success of the MS program can be assessed by the following indicators:

- Growing demand for, and enrollment into, the program over the decade
- High grade point average maintained for nutritional sciences courses and courses taken outside of nutritional science
- High completion rates of enrolled students
- High rate of employment in jobs in the field of nutritional sciences after graduation

Degree to which standards of success have been met in the MS degree program in nutritional sciences. Our performance in the above indicators is:

- Enrollment has grown nearly 10% over the last five years compared with the previous five year period
- The grade point average for our students over the last five quarters is 3.63
- During the last five years, 95% of enrolled students graduated
- All students graduated with MS/RD-eligible obtained employment in their field; all doctoral graduates successfully obtained post-doctoral, faculty, or research appointments.

In the past five years, 29 students have graduated with an MS, RD-eligible; and an additional 12 graduated with an MS, 8 of whom entered with an RD; two others are expected to take and pass their RD exam this year, and one went directly to medical school. Graduates with MS, RD-eligible degrees are employed in a wide variety of clinical and public health settings. Besides hospitals and extended-care

facilities, graduates are employed in program development and management at county health departments and in preventive health programs for the community and industry. Some graduates have chosen private practice, others serve as consultants to groups homes, schools, and public health agencies, focusing in program monitoring and assurance.

Probable causes for success of the MS program. The MS program is successful for many reasons, but chief among them is being situated in a community setting that is rich with diverse clinical and public health experiences. The core and interdisciplinary faculty have relationships extending widely into the community, allowing the students opportunity to observe and participate in an enormous variety of nutritional science practice.

Factors that have impeded the ability to meet objectives of the MS program and plans for overcoming those impediments. Impediments to our success are largely due to decreased number of faculty from attrition, as discussed in section II.D.

We believe that the MS program can be further strengthened by involving a greater number of interdisciplinary faculty in lecturing and mentoring activities. In addition, we are in the process of evaluating the curriculum to determine if a qualifying examination given prior to undertaking the thesis project is needed. A standard text may be useful to assure that all students demonstrate a basic proficiency in nutrition sciences knowledge. It may also help to establish a standardized thesis proposal review process that identifies certain elements required in each proposal.

Master of Public Health-nutrition degree. The MPH degree eligible (see Appendix G) is a professional degree and has no formal relationship with the PhD program. It is currently offered only to students who have their RD certification, or are RD-eligible. We are currently in the initial stages of planning a combined MPH/dietetic internship. This would allow us to admit qualified students to a three-year program in which they can obtain both an MPH and RD-eligible training.

Objectives of the MPH program in nutrition in terms of student learning and other relevant outcomes. Graduates of the MPH-nutrition program can be expected to participate in policy analysis and program development and/or to design and manage population-based community wide interventions as part of a large scale public health program. Specific learning objectives for this program are as follows:

- To provide a broad overview of the public health system and the environment in which public health recommendations are interpreted and implemented.
- To provide basic analytical and administrative skills to integrate nutrition into public health core functions of assessment, policy development and assurance.
- To provide an opportunity for advanced study of a particular topic in public health nutrition.

Benefits of the MPH-nutrition program to the academic unit, the university and the region. The presence of MPH-nutrition students in public health classes side by side with students in other MPH programs in the SPHCM leads to greater interaction between students with different backgrounds and between faculty trained in different disciplines. This broadens and enriches the Nutritional Sciences Program. Networks with public health nutritionists around the state are fostered and strengthened through both the concurrent field experiences and the summer block field experience which are integral parts of the MPH-nutrition degree program.

The MPH-nutrition program arises out of a perceived need by prospective students and by public health agencies in the State of Washington. It therefore benefits the university by demonstrating a responsiveness by the university to such an expressed need. As the program grows, the university will benefit from having another strong MPH program in its portfolio.

Graduates of the MPH-nutrition program will have received academic public health preparation in biostatistics, epidemiology and environmental sciences, in health program planning, management and evaluation, and in advanced nutrition. State programs such as WIC and Head Start have expanded their need for public health nutritionists in recent years, and both programs receive strong Federal support. Leaders in state and federal programs in the region, including the chief of the office of WIC services in Washington State and the Region-X director of Nutrition agree that MPH-RDs with training in management, community assessment and planning are much in demand. Graduates of the program will be able to establish linkages with community nutrition programs, nutrition education, food assistance, social or welfare services, child care, services to the elderly, other human services and community-based research.

Comparison of the objectives of the MPH-nutrition program with programs at peer institutions. The objectives of our MPH-nutrition program are very comparable with programs at other institutions, due in part to the fact that the program was developed with reference to the *Curriculum Guide for Graduate Programs in Public Health Nutrition* (Strategies for Success), which was developed on behalf of the Association of Faculties of Graduate Programs in Public Health Nutrition.

Standards used to measure success in achieving the objectives of the MPH-nutrition program.

- Growing enrollment into the program over the first five years of its existence
- High completion rates of students enrolled in the program
- High rate of placement of graduates in jobs in public health nutrition.

Degree to which standards of success have been met and probable causes for success in the MPH-nutrition.

The MPH-nutrition program has just started its second year, so information on the indicators above is limited or does not exist. One student enrolled in the first year and one in the second year. The first student is expected to graduate this year.

Factors that have impeded the ability to meet objectives of the MPH-nutrition program and plans for overcoming those impediments. It is too early to identify impediments. The restriction to those already with an RD or RD-eligible may be an impediment, and this is being re-thought.

Additional steps envisioned to improve the overall quality of the MPH-nutrition program. We expect enrollment to increase as graduates of the program become known in the community, and as we begin the joint and concurrent training in the RD curriculum with the MPH. (Many interested students were not eligible to enroll this year because they did not yet have an RD certification). This increase of enrollment will enhance the program by fostering relationships and shared experiences among students, increasing the opportunities for fieldwork experiences in the community, developing a broader network of support for the program and for future employment of our graduates, and expanding research activities in this area.

The program also offers professional training in dietetics leading to RD-eligibility. This training is usually taken concurrently and is a complement to the MS and PhD programs to provide the clinical grounding they need. Many, if not most, graduates are not expected to be full-time clinicians but they may need the RD to be competitive in the job market. They also need the grounding in clinical dietetics to guide their research, administrative, or community intervention roles.

Professional Program: Dietetic Internship and Didactic Program in Dietetics. Both the Dietetic Internship and Didactic Program in Dietetics are approved by the American Dietetic Association (ADA; see Appendix G). Following completion of the Didactic Program students qualify to apply for our dietetic internship or for any other dietetic internship in the country.

Objectives of the Dietetic Internship and Didactic Program in terms of student learning and other relevant outcomes. The dietetic internship in nutritional sciences provides an opportunity for students to acquire simultaneously both an academic degree at the graduate level and guided clinical experience, culminating in their eligibility to take the national exam to become registered dietitians (RD). The RD is recognized by the medical profession as the legitimate provider of nutrition care. Dietitians are health professionals who serve the public by promoting optimal nutrition, health, and well being. They translate complex scientific information about nutrition and diet into relevant terms, food choices, and diet-related behaviors for individuals. A student who successfully completes the internship program and master's degree at the University of Washington will have the knowledge and performance skills required for the entry level clinical dietitian along with the enhanced knowledge, research skills and scientific understanding of a graduate level person in nutrition.(see Appendix G).

The objective of the Didactic Program is to provide students with the academic preparation required for application (as defined by ADA) to the dietetic internship while simultaneously working toward completion of a graduate degree, usually a master's degree in nutritional science.

Objectives for the Dietetic Internship program are as follows:

1. To provide very highly coordinated clinical practice and didactic information emphasizing clinical nutrition, and interdisciplinary patient care.
2. To provide intensive nutrition education in a practice area compatible with the student's interests.

3. To stimulate the student's interest in evaluating and conducting research that will enhance understanding of food, nutrition and dietetic practice.
4. To provide a setting in which students observe the highest standards of professional practice, and moral and ethical behavior.
5. To encourage the student to recognize their education is preliminary to a life-long process of learning and growth, and a professional process of continually expanding the bounds of the RD's role.
6. To produce graduates eligible to take the national examination for registration status in dietetics, and who will meet the entry level competencies of a registered dietitian, and certified dietitian in Washington state.

Benefits of the Dietetic Internship and Didactic Program to the academic unit, the university and the region. The dietetic internship provides training opportunities which translate nutrition academics and research into practical applications. Positions in the field of nutrition commonly require the RD credential.

The internship enhances the standards and delivery of nutritional care provided through the UW teaching hospitals in a number of ways. Clinical faculty, as well as dietitians at those facilities must stay abreast of nutrition research, at least in part, to provide students with the most current nutrition information and care standards available. Students, during their supervised training experiences, add to the quantity and quality of medical nutrition therapy services provided to patients at these facilities. These are chargeable services and contribute to the productivity and revenue generation of the Food and Nutrition Services Departments the UW and Harborview Medical Centers. In addition, interns often contribute to these departments by conducting clinical nutrition research projects for their theses or developing educational materials which focus on topics pertinent to the nutritional care of the patients in these medical centers.

Our clinical faculty and dietetic interns are trained and are frequently called upon to address the public's interest in current nutrition topics via the telephone, media interviews, consultations with professionals in the community, and speaking engagements. In addition, some of our students are placed in health care facilities throughout the greater Seattle area, and are able to enhance the delivery of nutrition

services provided in those facilities, and where applicable, contribute to the revenue generation of those Nutrition Departments.

Comparison of the objectives of the Dietetic Internship and Didactic Program with programs at peer institutions. Since the ADA establishes competencies for approved dietetic internships, there are commonalities among the different programs and institutions. The ADA approved/accredited programs are held to rigid standards which include competency based education. All programs must maintain similar objectives and outcomes are monitored. For example, placement of graduates of Didactic Programs in practicum programs must be at 70-80% for the five year evaluation periods, and passing the national registration exam is required for 80% of the graduates, averaged over five years, etc. ADA sponsors area meetings of program directors to assure sharing of skills and resources and produces a quarterly newsletter that further allows individual units to share expertise and information.

Despite these similarities with other programs, our dietetic internship distinguishes itself by offering clinical training in a major metropolitan city with opportunities for training and experiences in the most intensive settings available. The training opportunities facilitated by the presence of the University of Washington teaching hospitals greatly strengthen our internship. Few other programs in the northwest, or even on the west coast, offer the training in critical care medical nutrition therapy available to our students, and the broad range of facilities available for training in public health and nutrition counseling. The research training and thesis requirement in this program helps students to develop additional skills in organization, problem solving, and program planning. These skills are particularly valued in today's health care setting, where the evaluation of clinical outcomes, program effectiveness, and cost/benefit ratios are critical to adapting and surviving in the marketplace. An MS substitutes for a year or two of clinical experience in many nutrition departments and is often preferred by facilities hiring dietetic managers.

Standards used to measure success in achieving the objectives of the Dietetic Internship and Didactic Program.

The following are the major indices used to assess success of the internship:

- Five-year passage rate(s) on national dietetic registration exam
- Career placement

- Satisfaction surveys of dietetic intern graduates
- Satisfaction surveys of employers of dietetic intern graduates

Degree to which standards of success have been met in the Dietetic Internship and Didactic Program

Our dietetic internship is a new program, approved in 1996 to replace our pre-professional practice program in dietetics (AP4). Thus we have no data summarizing our performance in these measures. However, based on performance on graduates of our AP4, students in our program taking the national ADA registration exam have performed consistently at or above the national average, five-year passage rate exceeds 95%. In addition, 95% of the graduates have been employed in the field within 6 months of graduation.

Probable causes for success in the Dietetic Internship and Didactic Program. These programs have, over many years, developed a strong community support system and educational program which promotes success among our graduates. Key factors in our success include the following:

- High standards for achievement
- Clearly defined performance objectives with ongoing dynamic feedback and strategies to ensure student success
- Competency-based educational approach
- Rigorous coursework/academic preparation correlated with supervised clinical experiences
- Creative and varied approaches to teaching: problem-based learning, self- and peer-evaluation, teamwork, emphasis on critical thinking skills and innovative problem solving, effective use of community resources and expertise
- Ongoing adaptation to rapid changes in health care, dietetics research and teaching
- Strong relationships with the professional dietetics community and the UW teaching hospitals and dietetics staffs. Commitment to working, negotiating, and communicating closely with these groups to balance their needs and expectations with the learning needs/goals of our dietetic interns.
- Extensive mentoring and career networking opportunities provided to interns via the clinical faculty, teaching assistants and professionals at our training facilities.

- Ongoing effort to improve the quality of the program through formal and informal feedback from students, teaching assistants, training facilities/preceptors, community professionals, and prospective employers

Factors that have impeded the ability to meet objectives of the Dietetic Internship and Didactic Program and plans for overcoming those impediments. As mentioned elsewhere in this document, changes in faculty, and prolonged delays in hiring new faculty significantly increased the work load for the remaining faculty. Hiring a new faculty member and a director and working through the transition period after they are on site will add new resources to the Nutritional Sciences Program. It will also require the faculty and the programs some time to adapt and work through necessary changes/improvements.

Additional steps envisioned to improve the overall quality of the Dietetic Internship and Didactic Program.

We see three areas where the competencies of our graduates could be expanded with course work and experience:

1. *Intervention skills.* Few current education programs for health care professionals include significant objectives to accumulating skills in developing community-based and personal preventive health interventions. The dietetic professional now has some basis for developing intervention skills, i.e.,: some knowledge of health behaviors and attitudes, some knowledge of behavioral modification and some counseling skills. Our objective will be to expand these basics into comprehensive skills in both community health promotion and individual behavioral change. This goal suggests that dietitians of the future will spend more time developing and teaching the procedures that will lead to successful behavioral change.
2. *Management and leadership skills.* Although management practice competencies are an integral part of the current ADA competency requirements, both student and practitioner apathy toward these topics leads to marginalizing their importance. Students will need to acquire and embrace skills of management, leadership, and collaboration during their training programs. It is necessary to reiterate often published pleas for determination of cost/benefits of nutrition interventions, measures of productivity, establishment of standards of care and determination of outcomes of care. We must involve students in these processes until they accept management principles and

leadership skills as integral to good provision of service , their own success and the success of their programs in the marketplace, and the continued viability of their profession. Food service and food safety must continue to be important skills for the dietitian which can be complemented with resource management objectives.

3. *Research skills.* Recent publication by the ADA of the research agenda for dietitians focuses us both on the need for a scientific base for all dietetic practice and on the need for dietitians to be integral to the process. The dietitian of the future needs to be skilled at: a) developing research questions related to his/her practice, b) designing valid methods to answer such questions, and c) interpreting study results accurately. These skills are essential to the ongoing evaluation of the cost effectiveness of nutritional care and improvement of the quality of care delivered.

Elaine R. Monsen (UW faculty member, director of the Interdisciplinary Graduate Program in Nutritional Sciences, and editor of the *Journal of the American Dietetic Association*) in her book Research: Successful Approaches presents this charge:

Dietitians are assuming an increasingly major role in research, both as leaders and as collaborators. Research has an impact on all areas of dietetics. Dietetics and nutrition education are guided and updated by research findings. Practice-related research will continue to drive the future of dietetic professionals.

C. PhD degree

A student receiving a Doctor of Philosophy degree from the Interdisciplinary Graduate Program in Nutritional Sciences at the University of Washington will be prepared for the acquisition and dissemination of new knowledge and for professional practice in academics and research in the multidisciplinary science of nutrition (see Appendix G).

Objectives of the PhD degree in terms of student learning and other relevant outcomes. **The objectives of the PhD in Nutritional Sciences are as follows:**

1. To prepare students to meet the need for expanding both the base of new knowledge in nutritional sciences and the application of this knowledge in public health and clinical health care settings. The PhD program is designed to assist students in gaining an advanced understanding of nutrition and metabolism,

and of related biological, biochemical, molecular, and behavioral sciences, in acquiring skills in research methods, and in developing timely and original hypotheses in nutritional sciences.

2. To provide both the educational structure and opportunities to pursue advanced study and research training in clinical, public health, and experimental nutrition.

3. To meet the substantial state, regional, and national needs for faculty in departments of nutrition and other related health sciences and to fill leadership positions in agencies involved in generating policy and in organizations involved in research on the relationship between human nutrition and health.

Specific goals of the PhD program are to train students to perform in the following areas:

1. To be nutrition scholars who are able to translate sophisticated, multidisciplinary concepts of modern nutrition to the needs of individuals in the society.

2. To relate normal physiology, anatomy, biochemistry, and molecular biology to nutrition status and nutritional requirements.

3. To relate pathophysiologic changes to alterations in nutrition status and nutritional requirements.

4. To construct testable hypotheses, develop appropriate study designs, and conduct and publish the results of research which will significantly expand knowledge of nutritional sciences.

5. To be proficient in the use of modern technology for the acquisition and dissemination of information and to be knowledgeable of the process, sources and means of procuring researching funding.

6. To determine the nutritional status of individuals and groups.

7. To formulate nutrition care plans appropriate for individuals and for integrating these plans with total medical management.

7. To design nutrition counseling and educational programs for patients, health care professionals, and the general community.

8. To provide leadership and management for nutrition care programs and to give expert advice in the formulation of nutrition policy at the community, state, and national levels.

Benefits of the PhD program in nutritional sciences to the academic unit, the university and the region.

Benefits of the PhD program to the Interdisciplinary Graduate Program as a whole include an increased sophistication of research conducted in the program, a greater diversity of interests and expertise and the

availability of teaching assistants. For example, the longer term commitment of the PhD students to the Nutritional Sciences Program allows the students and faculty to pursue research topics that are more sophisticated and in-depth. This in turn enables the faculty to be more competitive for obtaining extramural research funding. Furthermore, because our PhD students frequently obtain their research training with members of the interdisciplinary group faculty, they have very diverse interests and areas of expertise. They are able to share these diverse interests with other members of the program by giving research presentations at our weekly program seminar. This helps to broaden the exposure of all of our students to different areas of nutrition research. Finally, all of the PhD students must obtain some experience in classroom teaching and student mentoring prior to graduation. This provides all of our students with additional access to one-on-one tutoring when they have problems understanding course material.

There are also benefits of the PhD program to the entire university and the Pacific Northwest. As recently mandated by President McCormick, the university would like to increase the involvement of undergraduates in research. Our doctoral students will greatly enhance the capacity of the faculty to provide these research training opportunities. Furthermore, our PhD students have in the past provided essential assistance in teaching several undergraduate courses offered through the program. Placement of our PhD students in the laboratories of the interdisciplinary group faculty has enabled core and group faculty to develop many strong research collaborations and our PhD students have on many occasions aided faculty not directly involved in nutrition research in the collection and interpretation of nutritional data. As there are only two other Universities in the Pacific Northwest that offer a PhD in nutrition (Washington State, Oregon State) and only a handful of additional options on the entire west coast, our program has already helped provide trained graduates to fill faculty positions in departments of nutrition and other related health sciences and to fill leadership positions in state and regional agencies.

Comparison of the objectives of the PhD program with PhD programs at peer institutions. There are not many major research universities (our peer institutions) which have PhD programs in nutritional sciences that offer an interdisciplinary approach with training in the three tracks of clinical, public health, and experimental nutrition as we do at the University of Washington. One exception, however, is the

University of Wisconsin, which has an interdisciplinary program like ours that is diverse in approach and objectives. The University of Wisconsin program differs from ours in that it offers training in animal as well as human nutrition.

Standards used to measure success in achieving the objectives of the PhD program in nutritional sciences.

The success of our PhD program is measured in a number of ways, including:

- The number and quality of applicants to the program from national and international students.
- Percent of students staying in the program and graduating in a timely fashion.
- Quality of didactic work as assessed by academic grades in courses both within and outside of the Nutritional Sciences Program.
- Number and quality of the publications and invited presentations derived from PhD dissertation research.
- Job placement of our graduates.

Degree to which standards of success have been met in the PhD program. We receive requests for information from prospective applicants from every state and from many countries throughout Europe and Asia. In 1995 we printed a program brochure and sent out 72 copies during the second half of that year. In 1996, the number increased to 265, and this year to 554. The number of applicants to the PhD program has also steadily increased and we now receive approximately 30 competitive applications per year (32 since the beginning of Autumn quarter 1996). Of these, a significant number are from graduates of institutions with excellent academic reputations such as the University of California, San Diego, the University of California, Berkeley, the Stanford University, the Columbia University, the University of Michigan, and the University of Wisconsin. The average undergraduate and graduate GPA of applicants accepted into the program over the past 4 years is 3.42/4.0 and the average scores on the Graduate Record Examinations of these same applicants over the past 4 years is 529 on the verbal and 608 on the quantitative components of the exam.

Since the inception of the PhD program in 1989, we have had 6 graduates with another expected to graduate this quarter. The median length of time from entry into the program to graduation has been 5.5 years. However, in several cases, this reflects the time to complete both a Master's as well as a PhD. In

addition, since the start of the PhD program only two students have dropped out, both due to financial limitations. Currently, there are 15 PhD students, 5 of whom have completed their qualifying examinations, and all of whom are making excellent progress towards completion of the degree requirements.

The quality of the didactic work of the graduates of our PhD program is reflected in the average GPA of these students of 3.68/4.0. This includes an average GPA in courses in nutritional sciences of 3.81/4.0 and in courses offered by other departments of 3.59/4.0. The average GPA of the 15 students currently pursuing their PhD is 3.65/4.0.

All of our PhD students are encouraged to publish the results of their dissertation research even prior to completion of the dissertation. This has resulted in a number of significant publications for each student in peer reviewed journals and in invitations for formal presentations. We have compiled this information for each of our PhD graduates and have included this information in the appendix L.

Perhaps the best indication of the success of the PhD program is the success of our graduates in finding jobs. In all cases, our graduates have already obtained faculty and/or research positions (5) or are currently doing additional post-doctoral training (1).

Probable causes for success in the PhD program in nutritional sciences. The success in the program is due to many factors inherent in a rich academic setting such as ours. Admitting highly qualified students is a key to success, as is utilizing the diverse resources available to help teach and mentor them.

Factors that have impeded the ability to meet objectives and plans for overcoming those impediments. We do not believe that there have been any significant impediments to our fulfilling our objectives as witnessed by the measures of success listed above. One current problem is the small number of core faculty within the program. This is due to an unexpectedly large number of faculty retirements since 1992 coupled with a slow response in filling these faculty vacancies. However, this has not impeded the progress of our current students because of the success we have had in enlisting our large interdisciplinary group faculty in supporting and mentoring our PhD students. Furthermore, we are currently in the process of hiring a new faculty member to fill an interim position and have 3 excellent finalists in our ongoing search for a new program director. We also hope to enlarge our core faculty by recruiting additional faculty

from our interdisciplinary group faculty and by enlarging this group faculty by strengthening our ties with nutrition professionals both within the university and the existing nutrition community in Western Washington.

We have already taken important steps toward improving the overall quality of the doctoral degree program by adding our third research track in public health nutrition. This now offers our students essential training and research opportunities in the important areas of nutritional epidemiology and community nutrition.

Additional steps envisioned to improve the overall quality of the PhD in Nutrition Program. In response to advances in molecular biology, we have recently developed a new course in molecular nutrition for our PhD students and we are in the process of standardizing our PhD qualifying examination and in adding training in the writing and submission of grant proposals to our curriculum.

IV. Responses To Change

A. Changes in teaching

New degree programs. In the past 10 years we added two new graduate degree programs, the MPH-nutrition and the PhD in nutritional sciences.

Changes to existing degree and professional programs. We advanced the dietetics program from a Pre-professional Clinical Dietetics Program to an accredited Dietetic Internship. With the move to the SPHCM, we added a Public Health Track to our MS and PhD degree programs. Many courses offered now incorporate a public health perspective and thesis and dissertation research projects can include opportunities in the public health sciences, as well as the clinical or experimental options. We anticipate this trend to continue and expand.

B. New developments that influence teaching

Interdisciplinary studies. Nutritional science is interdisciplinary by nature. The diversity among our core and interdisciplinary group faculty attests to this, as do the lectures and topics these faculty members present to our students. Interdisciplinary courses, such as Nutrition and Gene Expression (NUTR 551), draws on the expertise of scientists in diverse fields. We also offer courses that are cross-listed with other departments, such as Nutritional Epidemiology (NUTR 538/EPI 538) and masters and doctoral students of both departments take the course. (see Section II.B.). Students in the Nutritional Sciences Program are given wide flexibility in choosing both their course and lab work from a broad range of available disciplines throughout the SPHCM, the Medical and Nursing Schools, and the College of Arts and Sciences.

Competency- and problem-based learning. The Commission on Dietetic Education (CDE) was the first of the health education accrediting agencies to require competency based education -- now common among health professional training programs. CDE requires accredited programs to link both didactic classes and practicum experiences to a set of competences selected to best represent the knowledge and skills required by entry-level dietitians in every area of practice. This allows us to identify a selection of courses and experiences that will help students achieve the competencies upon which their national registration examination is based.

Problem-based-learning (PBL) is an evolving educational technique used widely in medical school and our program to link didactic and clinical experiences. PBL uses real patient problems and teams of students to work out not just the most acceptable interventions and outcomes but also the scientific support for their choices. This approach enhances the concept of teamwork, encourages cross-training among healthcare professions and models the process of self-directed learning and using educators and scientific literature and other healthcare professionals as resources.

We also anticipate we will place greater emphasis on scientific inquiry and less on didactic activities, which may alter the type and frequency of course offerings (see Section II.C.). In addition, we have begun to explore ways to meet the UW president's priority of involving undergraduates in research activities. Though we no longer have an undergraduate program, we hope to develop a new course that would offer undergraduates experience in a laboratory rotation in the program's experimental laboratories. Our priority, however, will continue to be on graduate education.

Distance learning. The program has no distance learning activities in place at present. Our existing computer equipment would have to be updated before it is possible for us to make course content available on-line. With increased use of educational technology, it may be feasible to develop a distance learning curricula for certain components of the program. We may consider the possibility of joining the extended degree MPH program in the future. An alternative approach we are considering and which has been used successfully in the MPH Extended Degree Program in Health Services is to offer the MPH program in concentrated modules, with interactive instruction in one week blocks two or three times per year, supplemented by other kinds of interaction. Our faculty places value on the opportunities for mentorship and sharing of ideas available to students who complete at least part of their degree program on-site.

Experiential learning. Experiential learning is a key component in the Dietetic Internship and the MPH-nutrition programs. Intensive field experiences, coupled with academic coursework, helps students bridge into the professional role. In order to enhance this aspect of our program, we are forming an advisory committee of professional leaders in the dietetics community to interface teaching and experiential learning in the Dietetic Internship.

Students have other experiential opportunities as well. Besides the thesis requirement that involves conducting a scientific inquiry, qualified students are given the opportunity to participate as apprentices in ongoing research in clinical, public health, and experimental nutrition, depending on their goals and readiness. For example, the faculty collaborate with the CHDD to offer a variety of experiences for students to assist with the nutritional care plans for children with special health care needs. Opportunities also exist within the UWMC for direct clinical nutrition experience, such as in the Neonatal Intensive Care Unit and in the Transplant Unit. Laboratory experiences are always available via lab rotations (NUTR 535). Sections II and III provide additional details about our experiential learning opportunities.

Doctoral students are required to obtain teaching experience as part of their training. Currently, most of the students work with the faculty as a teaching assistant in a single course and for dietetic interns in the clinical setting, as well as make presentations in nutritional sciences seminar series. We will include doctoral students in teaching activities of more of our lecture courses to further their training.

International study. International study experiences are available through contacts with faculty abroad and our faculty's involvement on the editorial board for an international journal. As an example, one doctoral student took advantage of the opportunity to assist with translation of a research text from Brazil. Additionally, some faculty have been exploring opportunities for research collaboration in vitamin A deficiency in Africa, for example. Increased collaboration and consultation with campus-wide, national and international colleagues along with using electronic communication can expand these opportunities.

Educational technology. The program uses educational technology in several ways. We use electronic mail extensively for communication with students, colleagues, collaborators, and collaborative sites. Faculty and students use the World Wide Web to research nutrition-related information. Our program has created its own Web page (<http://weber.u.washington.edu/~brochure/>) to provide information about the program, its faculty, and class offerings. We are currently adding course syllabi to the website. Faculty currently use videotaping for learning experiences with students. We anticipate that as the technology becomes more available, we will increase our use of it to augment educational experiences, create interactive learning assignments and tests, and reduce the reliance on teacher-centered lectures.

Ideas to maximize effectiveness.

Increase collaboration with interdisciplinary group and other faculty on campus.

Expand use of educational technology.

Expand opportunities for experiential learning.

Increase use of peer teaching and evaluation among students.

Create networks with nutritional scientists throughout the region.

Impediments.

The size of core faculty is currently insufficient to maintain the collaborations and networks. Restoring our faculty to its full membership will help overcome this impediment, as will developing ways to leverage state funds further (see Section II.D.). In addition, we can expand the core faculty and increase the involvement by the interdisciplinary group faculty by seeking out new collaborations, forming new partnerships, and maintaining the scientific excitement within the program. It will also help to increase faculty training related to educational technology and alternative teaching methods.

C. New developments

Revolutionary advances in the discipline. Nutritional sciences, like most other fields in the health sciences, has been greatly influenced by recent technological advances in molecular biology. Currently, many laboratories, including several associated with the program, are investigating the relationships between nutrient intake and the regulation of gene expression. In recognition of this rapidly emerging area of research in nutrition, we have developed and offered to our PhD students a new course entitled 'Nutrition and Gene Expression' (NUTR 551) and opportunities to do research.

There also has been huge growth in nutritional epidemiology over the last decade. Research in both methods and applications are receiving scientific and public attention. Interest in the relationship of dietary exposure variables with chronic disease led to an enormous increase in the number of case-control and population-based studies with nutrition as a focus. Promising leads then led to a number of dietary intervention studies. Special focus is now placed on the interface between nutrition and behavior, and nutrition and genetic expression. Our faculty is active in these areas of research (see Appendix K for examples) and we offer courses that train students in the needed skills (e.g., NUTR 538, NUTR 551).

Changing paradigms. One of the most important changes that distinguish modern approaches to the field of nutrition is the emphasis on the effects of **over-nutrition rather than undernutrition**. Out of this shift in focus has come the recognition that balanced nutrition is part of a healthy lifestyle which can play an important role in the prevention of chronic diseases, such as heart disease and cancer. This concept is central to much of our current curriculum and also reflects the research interests of many of our faculty. Advances in the field of molecular biology have influenced our current attempts to model the effects of over-nutrition and has enabled us to incorporate transgenic cell and animal models into our studies.

Health care reform has precipitated a new paradigm shift (JADA 95:598-606, 1995) that has resulted in new definitions and assumptions of health care and in new disciplines. Along with this, the workplace for professionals in health care, including dietitians and nutritionists, has changed. This has strong implications for educators training professionals, with the emphasis on collaboration, cross-training (multiple competencies), and preparation for new practice roles.

The future of dietetic education will be greatly influenced by the changes in health care delivery. We see dietetic practice expanding into more divergent areas increasingly emphasizing prevention and requiring excellent skills in behavioral change counseling. We presume fewer of our graduates will work in acute care facilities but those who do will be working in managed care milieus that demand continuous monitoring of quality of care standards and much increased awareness of providing 'seamless healthcare.' The skills and knowledge they will require will presume increased responsibility for provision of nutrition services including prescription, selection of mode, and monitoring. Increased numbers of graduates will be working in extended care facilities such as those working with people who have renal disease. The ADA has identified trends in the practice that will influence changes in entry-level dietetic education, including demands for a higher level of scientific knowledge and practical application, broadened competencies, and increased ability to perform as part of a multi-skilled team. The scope of competencies will be expanded in a field already quite broad; the ADA promulgated more than 50.

The other change that will influence nutritional science in general and the dietetics professional in particular will be the shift in government funding to **prevention of chronic disease through change in diet-related behaviors**. Washington state and several others have agreed to fund specific nutrition

services if delivered by a credentialed nutrition professional (i.e., the RD). In addition, Congress is considering a bill that would alter the Medicare/Medicaid section of the Social Security Amendment to include direct funding of nutrition services. These changes will provide for prevention services for the first time and should alter the delivery of health care significantly. There are many implications of this shift in priorities for nutritional science educators and researchers. We now offer a new course, 'Nutrition for Children with Special Health Care Needs (NUTR 530), as part of our effort to address the change in health care structure. Our program faculty have also responded to this change by focusing research on the issues related to changing dietary behavior. Several faculty are involved in dietary assessment methodology, and individual and community-based dietary intervention studies.

Funding patterns. As with other fields of science, we face increasing pressures in the current environment of diminished funding of research. Fortunately, nutritional epidemiology studies and studies of nutrition and gene interaction are well funded (see Appendix K).

New technologies. Because of the ability to identify and clone genes, interactions with diet and disease are easier to explore. There have been rapid technological advances in computer and laboratory equipment, much of which is applicable to current research in molecular nutrition. We have been able to use limited extramural funds to purchase some equipment that enables us to pursue basic questions in cellular and molecular biology. Using other resources from the program, we established a computer lab for our students and purchased a state of the art high pressure liquid chromatography system and a gamma-radiation detector, both of which are currently being used by students and faculty. By increasing collaborations with laboratories throughout the university (see Section II.G.), we have been able to access new technologies and share resources.

The creation of a National Information Infrastructure has broad consequences on education and research. We are exploring ways to be included in this technology. Some ideas are to participate in teleconferences; learn to manage information; develop alliances with technology providers and users; educate students about how to obtain, evaluate, and use information; instill a sense of inquiry; incorporate greater levels of educational technology into the curriculum; improve media skills.

Performance in these activities. Our performance in research, scholarly, and creative activities is outstanding as measured in several ways, as listed in section II. E. As shown, we have been very successful in the areas of obtaining funding, number of publications, invited presentations, and collaborations both within and outside the university. (See Appendix J, K)

D. Service activities

Service activities are outlined in section II.A. Faculty serve on committees for curriculum, promotion, admissions, and faculty searches for departments in the SPHCM and other schools, as well as providing numerous guest lectures through the programs in the allied health sciences. We anticipate that we will continue to receive an increasing number of requests for our program to offer service courses and guest lectures to other departments in the university. Meeting this request is increasingly difficult because of the small number of core faculty. We must fill our faculty vacancies and possibly expand the size of our core faculty in order to be able to carry out our service role adequately. It is our hope that, with added faculty, we can explore the possibility of expanding our role in undergraduate teaching and providing additional opportunities for undergraduates to participate in nutritional sciences research. We are also exploring the possibility of joining with other related programs such as Food Science and Environmental Health to develop a joint undergraduate major in Food Science, Nutrition, and Toxicology. (See also Section IV.E.)

Our service activities for the nutritional sciences professions in the community and the region are also likely to increase because service is part of the reciprocal network of collaboration; as we extend our collaboration we naturally extend our service activities in those areas.

There is widespread public interest in nutrition, coupled with a large amount of misinformation available today. It is our view that it is especially important for the program to serve in the capacity of providing accurate scientific nutrition information to the public. We also see this role as important public relations service to the university. We already frequently field questions from individuals and the media (see Section II.A.) but would like to formalize this process, perhaps by creating an appointment for this purpose.

Our performance in service activities is highly successful, as measured by the number of service courses, guest lectures, invitations to speak in the region and nationally. Please see appendix H for further details.

E. Strategies

Faculty retirements. We anticipate at least one faculty retirement over the next ten years. We will hire new faculty, planning some overlap with retiring faculty.

Undergraduate students. While the program is only a graduate program, we have been requested to and currently offer two undergraduate courses in nutritional sciences (NUTR 300/301). It may be necessary to consider additional courses or more frequent offerings of the current courses.

We expect that our faculty will donate more of their time to providing research opportunities and training for undergraduate students. We have also discussed joining with other related programs such as Food Science and Environmental Health to develop a joint undergraduate major in Food Science, Nutrition, and Toxicology.

Demands of working professionals. Many of our graduate students are already full-or part-time working professionals who have returned to obtain more advanced training. Thus, our course schedule is already designed so that most courses are held on the same days each week. The faculty will continue to be as flexible as possible in scheduling research conferences and seminars in order to meet the constraints of our working students. In addition, the program can consider links with the external degree programs, if feasible. We can also explore offering part-time and nontraditional options for degree programs. Increased educational technology will facilitate the development of distance learning programs and curricula. (see also Section IV.B.)

Doctoral training. We believe that, with the expansion of our degree programs to offer three distinct tracks (i.e., public health, clinical, experimental), we are in a position to provide doctoral training that meets the needs of both the academic institutions and industry. We require that our PhD students obtain teaching experience and are proficient in the use of new technologies for acquiring and disseminating information. We are also currently adding to our curriculum training in writing formal grant proposals. We believe that

these experiences should adequately prepare our students for jobs at the full spectrum of academic institutions and industry.

Emerging technologies. We need to have additional extramural funds that we could apply to new technologies for research and teaching. Should there be university-sponsored initiatives that assist programs to develop and acquire new technologies, we would certainly apply for this assistance. Meanwhile, the faculty can increase its use of university resources, particularly the electronic technology, to aid in teaching and research.

Pressure on space. The program faculty will participate in planning committees for the new Life Sciences building, such as faculty Council on Facilities and Services, and other planning committees as opportunities arise.

Pressure on budget. The program will explore ways to leverage state funds and increase its use of research faculty (see Section II.D.). We will explore developing and submitting pre- and post-doctoral training grants, seeking funding from local industries, and raising additional scholarship funds from alumni.

Demand for accountability. All departments in the SPHCM have recently instituted strong measures of faculty accountability and our faculty are subject to these policies, including documenting faculty workloads. Because of the existing faculty vacancies, core faculty currently teach well beyond the level required by their individual FTE appointments. As the plans to increase the number of faculty are implemented, we will distribute the number of FTE appointments to involve more faculty in teaching.

University assistance.

The University can:

- Support the needs for space by providing a guaranteed minimum with a mechanism for orderly expansion as the program grows. Priority might be given to moving the program to space nearer the SPHCM.
- Maintain the excellence of the Health Sciences Library - this facility is vital to our success.
- Maintain academic computing resources support.
- Maintain instructional support services.

- Offer additional support for teaching and programs for graduate students and faculty to improve teaching skills.
- Provide direction for and assist with fund-raising activities, especially for scholarship support for students.

F. Demographic changes

The Nutritional Sciences Program students, staff, and faculty are predominantly female. In addition, the program has always included older students and students of color among its student body. The program has been very successful at attracting and training minority students. We provide quality attention to students and applicants from ethnically diverse backgrounds, and many (19%) of our current students come from such underrepresented groups. We have maintained an admissions policy of accepting all minority applicants who meet our basic application requirements. In some cases, we have accepted students who were deficient in certain prerequisites and have worked with them to meet the requirements following entry into the program. Students of color hold assistantships and scholarships in our program to the same degree as non-minority students. In fact, we have recently obtained an NIH minority fellowship for one of our students. We will continue to maintain a significant minority enrollment and to work with these students to overcome any academic deficiencies.

Because food intake behavior is largely influenced by cultural and social determinants, we incorporate sensitivity to cultural differences and needs naturally into our course instruction and our research. We actively seek research and teaching collaboration with representatives of various ethnic groups in order to assure that our work is valid and appropriate in these population groups. In the future, we would like to actively recruit faculty from different ethnic groups.

G. Personal productivity

The program encourages productivity of faculty by:

- Recognizing time needed for grant preparation assigning tasks;
- Maintaining flexibility in teaching schedules in order to free faculty for short sabbaticals for research or scholarly activities;
- Providing additional staff support when possible;

- Mentoring of junior faculty by established faculty.

Impediments. An impediment to faculty productivity has been the prolonged faculty vacancies, addressed above. This has resulted in the teaching workload of each faculty to be larger than desirable, reducing the time available to write grants and conduct research.

A difficulty for the program core faculty has been the lack of an established means to either encourage or reward the faculty for productivity in research, teaching, or service. Because decisions about faculty merit increases and promotions are made through departments that provide the faculty appointment rather than the Nutritional Sciences Program, this has established a system whereby faculty with expertise in a different area, and in some cases with different expectations of productivity, are judging our faculty. For example, because of the small size, most of our core faculty currently do much more teaching and student mentoring, and thus may have less research productivity than colleagues in the parent departments. In the future, we hope to negotiate with the department chairs within the SPHCM to allow weight to be given to formal recommendations concerning merit increases and promotions for nutritional sciences faculty by the core faculty of the program.

V. Goals

A. Goal setting process

The program core faculty meet annually to review progress made toward goals previously established, to reassess current goals, and to set new goals as needed. Core faculty meet regularly during the year, usually once or twice per quarter, and goals are routine agenda items at these meetings. Standing committees set goals for the curriculum and student affairs. As appropriate the faculty decides to form a special committee whose task is to gather information, evaluate it, and make recommendations about procedures for implementing certain goals; alternatively, that task may be given to one of the existing faculty committees. For example, when the program established its goal to offer a MPH-nutrition degree, a committee was formed to research and develop the specialized curriculum and to establish the community connections that would be needed for the field training. The committee reported its progress in these efforts at each subsequent faculty meeting. Because goals are reviewed and assessed frequently in this way, the program maintains close supervision on goal implementation and is extremely flexible when modifications and changes to goals are needed. As the faculty grows, it may be desirable to plan an annual retreat for setting overall goals. Now that the program is established in its home school (SPHCM), we anticipate that our goals over the next ten years will be focused on enhancing our natural collaborations within health sciences and increasing the growth of the program.

B. Five-Year plan

Goals.

Expand the number of involved faculty

- Increase the size of the core faculty
- Explore closer links with the CNRU for teaching and mentoring of students
- Increase participation by faculty at the Cancer Prevention Research Program, FHCRC

Expand areas of research and teaching

- Focus on areas with special promise, e.g., dietary behavior change, biomarkers of dietary intake
- Interface with nutrition policy decisions
- Explore possibility of a program project grant with Environmental Health

- Establish an undergraduate research program
- Develop and offer a MPH/RD-eligible degree
- Develop a joint undergraduate major with Food Sciences and Environmental Health

Build on existing strengths

- Enhance the research capabilities in nutrition and gene expression
- Support studies of biological mechanisms and biomarkers
- Continue to design and implement randomized trials of dietary behavior change
- Increase study of dietary assessment methodology
- Obtain additional research funding from both federal and private/commercial sources
- Facilitate integration of basic and applied research
- Enhance cross-fertilization of ideas within core and extended faculty

Continue excellence in education

- Distribute teaching load among the enlarged program faculty
- Explore ways to leverage state funds
- Seek measures to raise funds to support student research
- Develop and obtain one or more training grants
- Explore potential for distance learning or independent study opportunities
- Explore the possibility of offering an extended degree program
- Strive to ensure that the research of all PhD students is financially supported
- Review admissions standards to maintain high quality of applicants to the program
- Review and formalize standards for masters theses and doctoral dissertations
- Develop and implement standardized qualifying exams for both the masters and doctoral students
- Successfully complete the ADA review and site visit for renewed approval of didactic program and dietetic internship
- Increase network of clinical facilities available for student experiences
- Explore the possibility of creating computer interactive programs in student evaluations of knowledge and performance

- Expand use of electronic/Internet technology for communications, research, teaching
- Evaluate the curriculum to ensure training reflects current important scientific trends
- Establish small external advisory committee

Rewards. If the program is successful in meeting these goals and attaining its potential in growth, it would be appropriate to consider promoting the program to department status.

Assistance by the university. Specific ways in which the university can assist:

- Help the program with fund raising measures
- Maintain stability in resources provided (i.e., budget, facilities, space, services)
- Ensure that grant offset funds come to the program
- Assist with writing and obtaining a training grant
- Facilitate development of a joint undergraduate major with Food Science and Environmental Health