

<b>Proposal to Restructure Graduate Nutrition Degrees at Iowa State University</b>
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- 1. Establish a new interdepartmental degrees program in Nutritional Sciences**
- 2. Establish new optional specializations within the degrees:**
  - Animal Nutrition
  - Human Nutrition
  - Global Nutrition
  - Molecular and Cellular Nutrition
- 3. Drop existing degrees in Animal Nutrition (Animal Science) and Nutrition (Food Science & Human Nutrition) graduate degree programs**

**Primary Departments involved:**

- Food Science & Human Nutrition (FSHN)
- Animal Science (AnSci)

**Secondary Departments involved:**

- Agronomy
- Biochemistry, Biophysics, and Molecular Biology
- Economics
- Health and Human Performance (HHP)
- Veterinary Diagnostic & Production Animal Medicine (VDPAM)
- Sociology
- Statistics

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## Summary

Nutrition at Iowa State University is already among the elite programs in the United States. However, the current proposal for a restructured program offers the potential to establish the Iowa State interdepartmental program in Nutritional Sciences as the very best. The faculty in nutrition and other allied disciplines deem that a restructured graduate nutrition program in the form of a campus-wide effort in nutritional sciences has the potential to invigorate an already strong program. Interdisciplinary programs in nutrition are currently the accepted approach across the country and we at Iowa State are in jeopardy of lagging far behind this standard. Thus, the nutrition faculty at Iowa State envisions that an integrated interdepartmental program will position our graduate program in a highly competitive position for attracting top-notch graduate students, as well as research funding. The two main departments involved are Food Science and Human Nutrition (FSHN) and Animal Science (AnSci). Both of these departments will discontinue their respective degree programs in Nutrition (human and animal) and will now focus on the Nutritional Sciences program for graduate level nutrition education. The current nutrition degree programs are housed in the each of these aforementioned departments, with associated faculty in many other departments and colleges. Currently, the Human and Animal nutrition programs each offer a full range of course work leading to both the MS and PhD degrees. For over three decades, the interdepartmental Nutritional Sciences Council at Iowa State University has provided an ongoing mechanism for cooperation between these and other departments relative to nutrition. The Council is responsible for many successful programs related to nutrition: seminar programs, summer lectureships, management of several endowments, and a research-granting program. In addition, the Council provides some coordination of graduate programs. The Council's long history of interdepartmental cooperation forms a good foundation for the new combined program in Nutritional Sciences. However, it is time for the graduate nutrition at Iowa State to move beyond coordination by the Nutritional Sciences Council to provide an optimal learning environment for students across campus. An interdepartmental nutrition program, coordinated by Professors-in-Charge, administered through the Graduate College, under the auspices of the Chairs of FSHN and AnSci, will provide the necessary structure for coordinating and enhancing interdisciplinary nutrition research and graduate education at Iowa State. Graduate students will be able to select from four specializations: Animal Nutrition, Human Nutrition, Global Nutrition, or Molecular/Cellular Nutrition. The expectation is that the proposed program will enhance our visibility and thus attract a wider variety of students, encourage our own excellent undergraduate students to apply, promote greater depth in one of the above areas of specialization, and overall strengthen our current programs. The Regents Program Review Questions for new Majors follows the program outline provided below.

## Program Outline

1. **Proposed Degrees:** MS and PhD
2. **Name of Degrees:** MS and PhD in Nutritional Sciences (**NuSci**) with optional specializations in Animal Nutrition, Human Nutrition, Global Nutrition, and Molecular & Cellular Nutrition

3. **Departments Involved:** The two main departments are the Department of Food Science and Human Nutrition and the Department of Animal Science. Both of these departments will discontinue their respective degree programs in Nutrition (animal and human) and will now focus on the Nutritional Sciences program for graduate level nutrition education. Other Departments in the proposed program are: Economics; VDPAM; HHP; Biochemistry, Biophysics, and Molecular Biology; Agronomy; Sociology; and Statistics, as well as others as the program develops.
4. **Contact Persons**
  - A. **Primary:** Steven Nissen, AnSci; 4-2353; Diane Birt, FSHN;
  - B. **Departmental:** Kevin Schalinske or D. Lee Alekel, FSHN
5. **Need for Proposed Program:** Nutrition at Iowa State University is already among the elite programs in the United States. The proposal for a restructured program offers the potential to establish the Iowa State University interdepartmental program in Nutritional Sciences as the very best of the Nutrition programs. The current two-program structure does not take full advantage of the opportunity to:
  - A. Offer a uniform and high profile platform for recruiting high quality graduate students,
  - B. Enhance campus-wide collaborative opportunities in research, and
  - C. Strengthen the teaching of graduate nutrition
6. **Objectives of the Program:** The faculty in nutrition and other allied disciplines believe that a restructured nutrition program in the form of a campus-wide effort in nutritional sciences at the graduate level has the potential to invigorate an already strong program. The objectives of the proposed program are to:
  - A. Become the preeminent nutrition program in the United States. Success will be reflected in national rankings and peer evaluation of the program.
  - B. Become more competitive in attracting high quality students and grants. Success will be reflected in greater numbers of students with higher entrance scores.
  - C. Become better educators of students in nutrition with emphasis on the integrative nature of nutrition. Success will be reflected in student exam performance and in student evaluations of the course(s).
  - D. Expand the faculty base to expose students to a well-rounded variety of disciplines. By involving more faculty in teaching and in student seminars, all students will be exposed to a robust nutrition experience.
  - E. Provide optional specialization programs that will allow students to target education to specific markets. Success will be measured by student placements in industry-specific and academic careers that match the specialization.
  - F. Support Iowa's increasing desire to be the world's food capital. A strong interdepartmental research and graduate education program in nutritional sciences will complement efforts to establish Iowa as the preeminent "food state".
  - G. Provide an interdisciplinary framework for funding of nutrition projects and/or new faculty positions. The proposed program offers opportunities to hire faculty that strengthen several colleges and departments simultaneously. Success will be reflected in the number of graduate students who choose a career in academia.
7. **General Description and Operation of the Program**

A. **Current Program:** The current nutrition degree programs are housed in the Department of Animal Science and the Department of Food Science and Human Nutrition, with associated faculty in many other departments and colleges. Currently the Human and Animal nutrition programs each offer a full range of course work leading to both the MS and PhD degrees. There are approximately equal numbers of nutrition-related FTE faculty in each department, although numbers of Animal Science faculty focused on nutrition is down because of a series of recent retirements. For over three decades, the interdepartmental Nutritional Sciences Council at Iowa State University has provided an ongoing mechanism for cooperation between these and other departments relative to nutrition. The Council has been responsible for many successful programs related to nutrition. These include several seminars programs (i.e., Current Issues in Nutrition), summer lectureships, management of several endowments, and a research-granting program. In addition, the Council provides some coordination of graduate programs. This long history of interdepartmental cooperation forms a good foundation for the new program in Nutritional Sciences.

B. **Proposed Structure**

The following outlines the proposed structure of the NuSci program, whereas a governance document is being drafted and will be ready by the time the program is approved and functional.

1) Responsibilities of the NuSci Board

- a. Fund yearly budgets for operation of the NuSci through:
  - i. Nondepartmental endowed funds
  - ii. Obtaining college and central funding
  - iii. Allocation of departmental funds supporting NuSci
  - iv. Fund raising activities
- b. Assure teaching faculty are available for staffing NuSci courses
- c. Communicate NuSci needs to the Colleges and the University

2) Responsibilities of the Professor-in-Charge (PIC)

- a. Oversee (chair) the Advisory Council in developing the yearly financial and academic plans
- b. Coordinate solicitation of intra- and extramural funds for operation of the program
- c. Coordinate admission procedures and assignment of graduate students to major
- d. If requested, the PIC will provide an evaluation of members of the nutrition faculty to Department Chairs for merit salary increases, award nominations, committee assignments, and other administrative details
- e. Appoint vacated chairs of the committees
- f. Manage interdepartmental assistantships
- g. Maintain student records
- h. Maintain an up-to-date file of NuSci faculty and their research interests
- i. Maintain addresses and activities of alumni of the curriculum
- j. Publish a newsletter

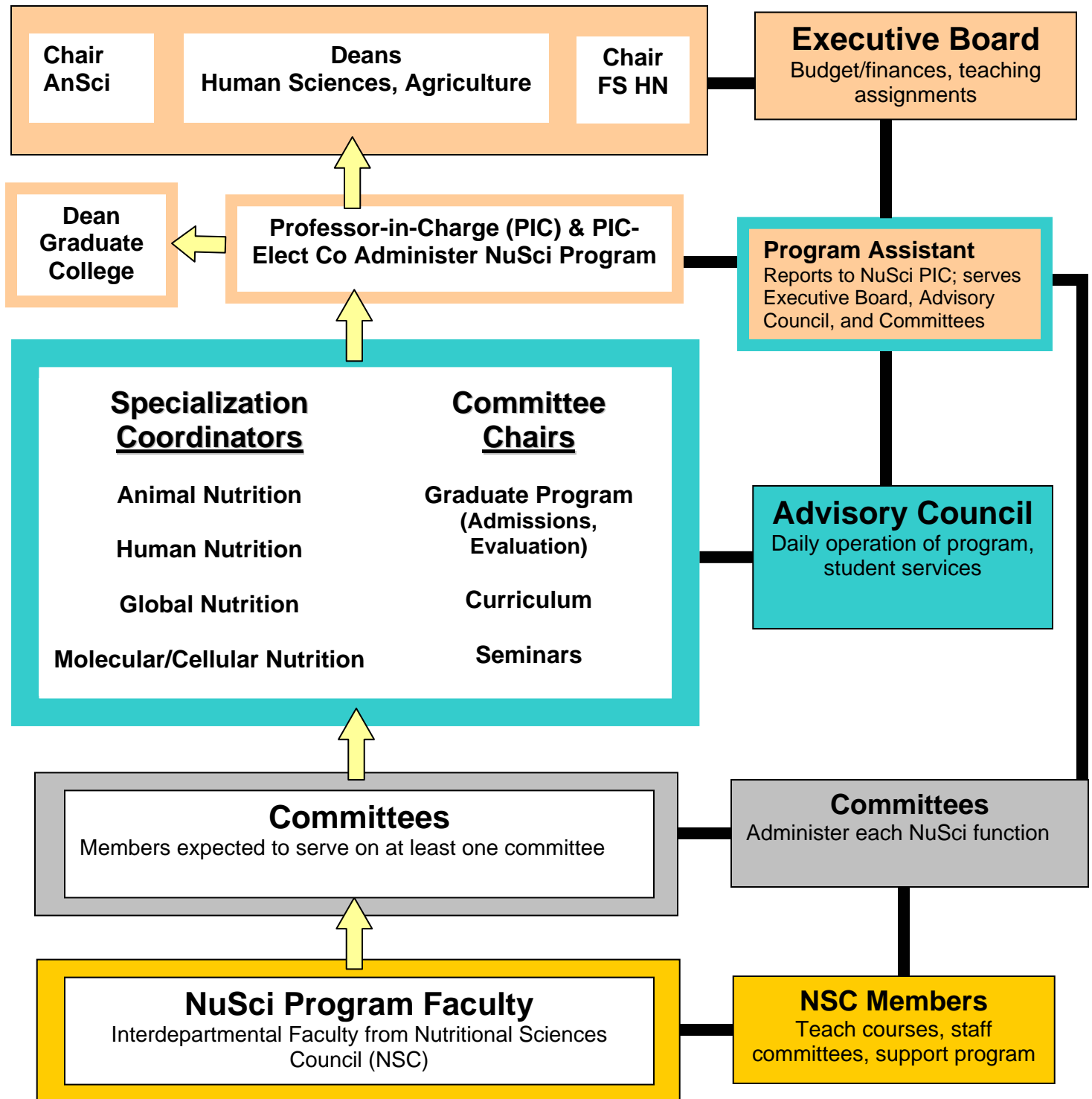
3) Responsibilities of the Professor-in-Charge (PIC)-Elect

- a. In conjunction with the PIC, Co-Administer the program as outlined above

- b. Oversee (chair) the Graduate Program Committee, which will include Admission and Evaluation of graduate students
- 4) Responsibilities of the Advisory Council  
The Advisory Council will be made up of coordinators of each specialization (outlined in section D.iii) and chairs of the committees who will:
- a. Meet monthly
  - b. Develop the yearly academic and financial plan for the NuSci program.  
The plan will be developed with the input of all members of the committees. At the spring meeting of the NuSci program, the plan will be approved by the NuSci program faculty. The NuSci Board will then evaluate the plan and if necessary revise the plan with the input of the Advisory Council.
- 5) Responsibilities of NuSci committee chairs
- a. Implement and oversee the operation of the committees
  - b. Attend regular meetings of the Advisory Council and communicate the needs and plans of the committee

C. ***Application Procedure:*** Students may apply directly to the interdepartmental Nutritional Sciences Graduate Program Admissions Committee or to a department of his or her choice and request to be considered as a NuSci student. The Graduate Student Selection Committee then will evaluate the completed application. If a student requests to become a member of a specific research group, that request will be honored if the major professor and student mutually agree to the relationship. If the student is uncertain of which research program to join, the student will participate in a “rotation system” at the initiation of his or her graduation program if the student is selected for one of the NuSci’s research assistantships. The department of the student’s major professor will house the admitted student officially. The student and potential major professors will provide the Admissions Committee with choices after the rotation period. Students will be matched with major professors on the basis of mutual research interests and availability of financial support. Applicants may apply to the MS or PhD degree program, although most students will elect to finish the MS degree prior to a PhD. Completion of the MS degree is, however, not a prerequisite for entry into the PhD degree program. General requirements for admission are listed in section 9 below.

Operational Chart/Outline of the interdepartmental **Nutritional Sciences** program:



D. **Program of Study (POS):** Generally new students will be admitted into the MS program. Upon completion, students can then apply for admission into the PhD program. Exceptional students with experience can apply directly to the PhD program. The general requirements of the NuSci Degree at the MS level are (in addition to those of Graduate College):

1) MS degree program

- a. Completion of Nutritional Sciences 501 & 502 and a minimum of 2 additional credits of graduate-level advanced nutrition or nutritional-physiology
- b. Completion of 3 credits of graduate-level biochemistry
- c. Completion of 3 credits of graduate-level statistics
- d. Attend NuSci seminar(s) (R credit)
- e. Complete one semester credit of student seminar yearly
- f. Completion of other courses established by the POS committee
- g. Minimum of 30 graduate-level semester credits, not less than 22 of which must be earned at Iowa State University
- h. Minimal grade point average of 3.0 (non-research credits)
- i. Requirements met within five years
- j. Successful completion of a thesis and defense of the thesis

The general requirements of the NuSci Degree at the PhD level are (in addition to those of Graduate College):

2) PhD degree program

- a. Completion of all requirements of the MS in NuSci
- b. Completion of an additional 3 credits in graduate-level biochemistry
- c. Completion of an additional 3 credits in graduate-level statistics
- d. Completion of an additional 3 credits in graduate-level systemic physiology
- e. Complete one semester credit of student seminar yearly
- f. Completion of at least an additional 6 graduate credits of advanced nutrition to be determined by the POS
- g. Minimum of 72 graduate-level semester credits, no less than 36 of which must be earned at Iowa State University
- h. POS Committee may recommend course work and research credits earned for the MS degree at another institution be transferred. Course work not a part of completed MS degree program may be transferred
- i. Minimal grade point average of non-research credits of 3.0
- j. Requirements met within five years of a graduate program after earning an MS degree or seven years of a graduate program after earning a BS degree but without an MS degree
- k. Satisfactory completion of a written preliminary examination that is prepared by the Examination Committee (see below)
- l. Satisfactory completion of an oral examination part of the preliminary examination
- m. Satisfactory completion of a dissertation and defense of the dissertation

- 3) Specializations: In addition to the NuSci degree, the following optional specializations are proposed at both the MS and PhD levels. Additional specializations, such as Animal Clinical Nutrition, may be added in the future depending upon need. Specializations are intended to provide students with the opportunity to obtain in-depth learning in their particular area of interest. A separate admissions committee within the specialization approves admissions into these programs. Application into each of the following optional specialization program is normally made after the first year of the MS program and anytime after admission into the PhD program:
  - a. Animal Nutrition
  - b. Human Nutrition
  - c. Cellular and Molecular Nutrition
  - d. Global Nutrition
  
- 4) Questions addressed related to Specializations
  - a. Other existing areas of specialization for the same major and same degree: None
  - b. Areas of specialization optional or required: Optional
  - c. Reasons for proposing the new area of specialization or change in the area of specialization: The main reason is to serve the needs of students who are focused on specific areas of nutrition and want this recognition on their degree. For example, students who specialize in Animal Nutrition are focused on employment in agriculture-related nutrition. Likewise, students who want special recognition and training in human-related nutrition will opt for the human nutrition specialization. Similarly, some students will choose to focus on global nutrition or molecular & cellular nutrition.
  - d. Requirements for the area of specialization: Each specialization will establish a core group of courses that will satisfy the specialization course work. There will be some latitude given to the POS committee, but in general 5-6 credits of focused nutrition (for example animal-related nutrition courses) will be necessary for the MS degree while 8-10 credits of focused nutrition will be required for the PhD degree.
  - e. Estimate the number of students who will graduate in the program each year: It is anticipated that 10 students will graduate from the Nutritional Sciences program each year and that 1-3 students will graduate in each of the 4 areas annually.
  - f. Recourses available to support the area of specialization: As the Animal Nutrition (AnSci) and Nutrition (FSHN) majors are being dropped as part of this proposal, resources and faculty will be shifted toward the NuSci program and the specializations.
  - g. Future financial support needed: See section 10 B.
  
- 5) Membership of POS Committee: For the MS degree student, at least two members and, for the PhD student, at least three members of the POS committee shall be members of the faculty of the NuSci Curriculum. Ordinarily, members of the ISU Graduate Faculty and of the interdepartmental



Nutritional Sciences Council will be eligible to direct programs of study of graduate students with NuSci major. Major criteria for eligibility for membership of the NuSci faculty will be based on research potential and productivity and experience with graduate student training.

E. ***Evaluation of Progress of Graduate Students:*** During the spring of each year, the Graduate Program Committee will use a formalized report (to be developed later) to provide the student with a written evaluation form for each student's progress toward the MS or PhD degree.

- 1) Doctoral program written preliminary exam: The purpose of the exam is to provide an opportunity for graduate students to study, in an integrative manner, a wide array of nutrition-related material to prepare them for near-term research activities and long-term professional development. The written exam will be based on graduate core courses, biochemistry, physiology, and basic nutrition knowledge. A list of competencies will be developed that will be made available to students and all NuSci faculty, with examinations based on this list. A subcommittee of the Education committee will administer the exam.
- 2) Doctoral program oral preliminary exam: The oral exam is similar in scope to the written exam, with the major difference being the student's ability to immediately respond to questions. The oral exam will be administered and the content controlled by the POS committee. However, it is expected that a major portion of the exam will be the public defense of a written dissertation research proposal.

## 8. Description of the New Program

A. ***Unique Environment of the New Program:*** The strength and innovation of the proposed program is based on the extraordinary breadth of expertise available on campus relating to nutrition. In addition to being one of the largest nutrition programs in the nation, there are many unique nutrition-related centers on campus that make the proposed NuSci at Iowa State like no other. These centers are unique to Iowa State University/Ames making the proposed program not duplicated elsewhere. These include:

- 1) Center for Designing Foods to Improve Nutrition (CDFIN)
- 2) Plant Sciences Institute
- 3) National Animal Disease Center
- 4) National Swine Research Center
- 5) NASA Food Technology Commercial Space Center
- 6) Roy J. Carver Co-Laboratory Business Incubator
- 7) Leopold Center for Sustainable Agriculture
- 8) Center for Research on Dietary Botanical Supplements

B. ***Comparison to Other Institutions:*** There are some 25 institutions in the United States that have interdepartmental nutritional sciences programs that vary from

stand-alone Departments, to Divisions within colleges, to interdepartmental programs. Many of the programs have only human nutrition programs. Of programs having both Animal and Human Nutrition programs, those at Illinois, Wisconsin, Cornell, Purdue, Missouri, and Minnesota retain the Animal and Human Nutrition major, as well as offering the interdepartmental Nutritional Sciences major. The Davis program appears to be unique in that almost no advanced degrees are granted within Departments but instead offer MS and PhDs through interdepartmental programs. Texas A&M has a combined human and animal nutrition program, but it is unique in that the program is housed in the Animal Science. Kansas State and Iowa State Universities are unusual because neither offers an interdepartmental nutritional sciences program. Although Iowa State is one of the last to make the change to an interdepartmental nutrition program, we have the advantage of learning from other institutions. The Iowa State program currently has about 70 faculty who are associated with the interdepartmental Nutritional Sciences Council. Most of these faculty members are directly involved in research and many of these faculty will become training faculty for this proposed program. It is estimated that about that many faculty will be involved in the new program. This makes the proposed program one of the largest nutrition programs in the nation.

- C. ***Other Differences in the Proposed Program:*** Another important difference in the Iowa State program is that we do not have a medical school associated with our campus. Almost all the comparable interdepartmental nutritional sciences programs have a campus medical school. Although this can be a disadvantage in terms of human nutrition support, it may also be an advantage in that a medical school will not compete for “nutrition turf”. ISU nutrition does, however, have a clear advantage over other programs in that several unique institutions are located on the campus of Iowa State and in Ames that support the nutrition program. These include CDFIN, The Plant Sciences Institute, The National Animal Disease Center, The National Swine Research Center, The NASA Food Technology Commercial Space Center, The Roy J. Carver Co-Laboratory Business Incubator, The Leopold Center for Sustainable Agriculture, and several other commercial companies that are involved in nutrition research. This forms an excellent platform upon which to build further nutrition research.

## 9. Program Educational Requirements

- A. ***Prerequisites:*** The following undergraduate course work is recommended of all applicants but may be modified depending upon the student's area of emphasis. Under certain circumstances students can be admitted or provisionally admitted with course work deficiencies:
- 1) Organic chemistry with laboratory
  - 2) Physics
  - 3) Analytical chemistry
  - 4) A nutrition course that requires biochemistry or organic chemistry as a prerequisite
  - 5) A course in biology/physiology or anatomy

B. **Language Requirements:** None required

C. **Course and Seminars Currently Available for Credit Toward Program**

1) Current courses – Animal Sciences

- a. An S 501. Survey of Animal Disciplines. Cr 1.
- b. An S 505. Introductory Techniques in Nutrition Experimentation. Cr 3.
- c. An S 511. Applied Ruminant Nutrition. Cr 2.
- d. An S 512. Applied Non-Ruminant Nutrition. Cr 2.
- e. An S 518. Digestive Physiology and Metabolism of Non Ruminants. Cr 3.
- f. An S 519. Digestive Physiology & Metabolism of Ruminants. Cr 3.
- g. An S 549. Advanced Vertebrate Physiology I.
- h. An S 551. Animal Molecular Biology. Cr 3.
- i. An S 552. Advanced Vertebrate Physiology II. Cr 4.
- j. An S 552L. Advanced Vertebrate Physiology Laboratory. Cr 1.
- k. An S 553. Biochemical and Physiological Basis of Nutrition: Macronutrients. Cr 3.
- l. An S 554. Biochemical and Physiological Basis of Nutrition: Vitamins & Minerals. Cr 3.
- m. An S 590. Special Topics. Cr 1 to 3.
- n. An S 603. Seminar in Animal Nutrition. Cr 1.
- o. An S 618. Advanced Nutrition and Metabolism—Minerals & Vitamins. Cr 3.
- p. An S 619. Advanced Nutrition and Metabolism—Protein. Cr 2.
- q. An S 620. Advanced Nutrition and Metabolism—Energy. Cr 3.
- r. An S 680/FS HN 680. Modern Views of Nutrition. Cr R.
- s. An S 699. Research.

2) Current courses – FSHN

- a. FS HN 542. Introduction to Molecular Biology Techniques.
- b. FS HN 543. Medical Dietetics II. Cr 3.
- c. FS HN 548. Professional Development Assessment. Cr 1.
- d. FS HN 553. Biochemical and Physiological Basis of Nutrition: Macronutrients. Cr 3.
- e. FS HN 554. Biochemical and Physiological Basis of Nutrition: Vitamins and Minerals. Cr 3.
- f. FS HN 561. Disease and Medical Nutritional Therapy I. Cr 4.
- g. FS HN 562. Assessment of Nutritional Status. Cr 3.
- h. FS HN 564. Disease and Medical Nutrition Therapy II. Cr 3.
- i. FS HN 565. Malnutrition in Low-Income Countries. Cr 2.
- j. FS HN 566. Nutrition Counseling and Education Methods. Cr 3.
- k. FS HN 567. Nutrition for Dietitians. Cr 3.
- l. FS HN 581. Seminar. Cr 1.
- m. FS HN 590. Special Topics. Cr arr.
- n. FS HN 596. Food Science and Human Nutrition Travel Course. Cr 2 to 4.
- o. FS HN 665. Selected Topics in Nutrition. Cr 1-2 each time taken.
- p. FS HN 681. Seminar. Cr 1.
- q. FS HN 695. Grant Proposal Writing. Cr 1.

r. FS HN 699. Research. Cr var.

**D. Proposed New Courses and Modifications of Existing Courses**

1) New courses

NuSci 501 and 502 are **core courses**.

a. NuSci 501. Nutritional physiology and metabolism I. Cr 4.

b. NuSci 502. Nutritional physiology and metabolism II. Cr 3.

The following 1(+)-credit course offerings are intended to provide greater flexibility and more options for students and to ensure that we will enroll a minimum number of students each time they are offered:

c. NuSci 590. Special Topics. Cr. arr.

d. NuSci 650: Seminar in Nutritional Sciences Cr 1.

e. NuSci 619: Advanced mineral nutrition: Micro minerals. Cr 1.

f. NuSci 620: Advanced mineral nutrition: Macro minerals. Cr 1.

g. NuSci 621: Advanced carbohydrate nutrition. Cr 1.

h. NuSci 622: Advanced lipid nutrition. Cr 1.

i. NuSci 623: Advanced protein nutrition. Cr 1.

j. NuSci 624: Advanced vitamin nutrition I: Water soluble vitamins. Cr 1.

k. NuSci 625: Advanced vitamin nutrition II: Fat soluble vitamins. Cr 1.

l. NuSci 626: Advanced energetics and nutrition. Cr 1.

m. NuSci 627: Special topics. Cr 1-3.

n. NuSci 690: Special Problems. Cr. arr.

o. NuSci 699: Research. Cr. var.

2) Dropped courses

a. AnS 603

b. Additional courses will be dropped as necessary as the program develops

3) Modified courses

It is anticipated that as the program develops many of the existing courses will be modified to target specific areas in both animal and human nutrition. For example, AnS 518 (Digestive physiology and metabolism of non-ruminants) will be reduced to 2 credits and will focus on applied non-ruminant animal nutrition.

**E. Thesis and Non-Thesis Options in Master's Program:** Only a thesis masters program will be offered

**F. Impact of Dropping Current Programs**

1) Rationale for discontinuation

The Animal Nutrition degree in Animal Science and the Nutrition degree in FSHN will be discontinued and replaced by a new interdepartmental program called the interdepartmental Nutritional Sciences program.

2) Availability of similar programs at other Regent's institutions

No other Regent institutions in Iowa offer undergraduate or graduate degrees in Nutrition. The replacement program proposed will streamline the teaching of nutrition at Iowa State University.

3) Enrollment data of nutrition grad students for current and previous four years

<b>Enrollment year</b>	<b>Animal Science*</b>	<b>FSHN</b>	<b>Total</b>
2000	34	19	<b>53</b>
2001	29	22	<b>51</b>
2002	27	22	<b>49</b>
2003	25	20	<b>45</b>
2004	18	24	<b>42</b>

We anticipate that our projected increase in student numbers with the initiation of the interdepartmental program will average 6 per year, with enrollment reaching 60 students in 2008. This increase in enrolment is anticipated because the new program will have much greater visibility and our recruitment effort is expected to be much more effective.

\*The recent decline in Animal Science Nutrition graduate student numbers was due to several faculty retirements that decreased the number of faculty mentors for nutrition.

**G. Impact of Dropping Current Programs with Regard to Board Of Regents**

1) Student survey from each program

Graduate students in AnSci and FSHN were asked questions (Fall '04) related to the newly proposed interdepartmental Nutritional Sciences program, particularly whether or not they wanted to drop the Nutrition program in their respective department and change to the new program. Students in existing programs who do not want to change to the new program will be able to continue without the penalty of taking additional courses. Their responses are summarized below:

<b>Questions</b>	<b>Animal Science (n = 13) Number of Students</b>	<b>FSHN (n = 15) Number of Students</b>
Willingness to change to the new NuSci program once implemented	5	6
Preference to continue with their current program after NuSci is implemented	8	9
Desire to transfer to other programs at ISU after NuSci is implemented	0	0
Desire to leave ISU after NuSci is implemented	0	0

2) Projection of faculty and staff needed to accommodate student needs in order to maintain program quality, and both a time frame for, and the costs of, program phase-out.

Students who currently want to continue their degree in Nutrition from either AnSci or FSHN will complete the requirements within the context of course offerings.

- 3) A description of the amount of money, if any, that would become available for redirection under the institution's strategic plan as a result of the discontinuance of a program.

No money will be freed up as a result of discontinuation of the program because the resources will be all used for the replacement program in interdepartmental Nutritional Sciences.

- 4) A description of the impact the discontinuance will have on other programs offered by and the overall mission of the institution.

No negative impact on other programs is anticipated. All the current course offerings will be continued in some new form.

- 5) A description of the impact on minorities and on women.

No specific impact will be born by minorities or women.

- 6) A description of the potential faculty and staff reductions or reassignments that would result from the discontinuance.

The entire nutrition faculty in Animal Science and FSHN will refocus their efforts on the combined interdepartmental Nutritional Sciences Program. Total workload would not change but quality should improve in that duplicated courses in FSHN and AnSci programs would be eliminated.

- 7) A description of how existing facilities and equipment freed by the discontinuance would be utilized.

The interdepartmental Nutritional Sciences Program would not free facilities or equipment because of program replacement.

#### ***H. Requirements and Standards for Admission***

- 1) Graduate Record Examination scores in the aptitude tests and, as an option, in the advanced chemistry, biochemistry, or biology test
- 2) TOEFEL score of at least 550 or a TWE score of 5.5
- 3) Transcripts and GPA of >3.0 is recommended but can be waived in exceptional circumstances
- 4) Recommendations, on official letterhead, should be obtained from at least three faculty who have knowledge of the applicant's scholarship, research aptitude, and personality
- 5) Statement from applicant that describes his or her research interests and future plans

#### **10. Description of Resources Currently Available and Future Resources Need**

- A. ***Current Resources:*** The interdepartmental Nutritional Sciences Council and the affiliated Departments have considerable faculty and resources currently organized and available (The nutrition Sciences Council has about 70 faculty

members as noted above). Some 50 faculty are involved directly in nutrition research and about 15 of these participate in offering graduate classes in nutrition. In addition, the nutrition-related facilities encompass both animal and human nutrition and clearly rank among the best in the world.

- 1) Teaching faculty: Courses in advanced nutrition are currently taught by nutrition faculty in both FSHN and AnSci. The new combined effort will improve efficiency and quality by joining the best expertise of faculty in both programs into a single effort. It also allows the faculty to design new teaching efforts from the ground up to better meet the needs of students.
- 2) Research facilities and faculty: Nutrition research faculty across campus number about 50. Most are members of the Nutritional Science Council. The major research facilities associated with nutrition include:
  - a. CDFIN has capacity to conduct human feeding studies and some metabolism work (expansion of this facility is proposed)
  - b. State-of-the-art animal metabolism facilities in the Kildee Hall addition
  - c. Comprehensive laboratory analysis facilities in both MacKay Hall and Kildee Hall (~2/3 of Kildee Hall nutrition laboratories need renovation)
  - d. Extensive animal feeding facilities located close to Ames can be used for nutrition experiments in all major food-producing animals
- 3) Endowments: The Council now administers about \$1 million in endowed funds for research and education. These funds allow the Council to fund smaller start-up projects in nutrition and allow the funding of nationally known speakers to come to campus. Additionally, there are funds available for 1-2 postdoctoral positions. These funds serve to greatly enhance the chances for success and leverage of these funds to gain even greater resources.

## B. New Resources and New Efforts

<b>Essential / Required Resources (Pledged and/or Requested)</b>				
	<b>Needs</b>	<b>Initial Cost</b>	<b>Ongoing Yearly Costs</b>	<b>Possible Source of Funds</b>
Fund GRAs for first year rotations	4 departmental	\$0	\$0	AnSci and FSHN will reallocate 2 GRAs each
	6 new by Spring 2008	\$150,000	\$150,000	Requests being made to Ag & FCS Colleges and central administration to contribute 6 GRAs by 2008 (2 each)
One Faculty Member as NuSci PIC	Quarter time release	\$0	\$0	Departments
Program Assistant	0.5 FTE new	\$25,000	\$25,000	Funding requested from Grad College and Departments
<b>Resource Enhancement (Proposed reallocations to fully achieve our vision)</b>				
Faculty	3 new	\$225,000	\$225,000	New faculty initiatives – central funding

Training Grants for Graduate Students	10 GRAs	\$250,000	\$250,000	Faculty to submit grants for: NIH Training Grants USDA National Needs Fellowship
Postdoctoral fellow	3 new	\$150,000	\$150,000	Funding to be Raised from Endowments and/or on grants
General Clinical Research Center (GCRC) with emphasis in nutrition	20,000 sq ft in/out patient study areas + Operating and Support budget	\$3M	\$1.5M	Combination of internal & external (NIH) funding
Center for Designing Feeds to Improve the Environment	No facilities needed; 20,000 sq ft will need to be remodeled	\$3M	\$500K	Combination of internal & external (NIH) funding

- 1) Faculty: The dropping of the Animal Science and FSHN Nutrition degrees frees up faculty resources to teach the new NuSci courses, although there are many faculty gaps that existed before the restructuring that will remain after the changes are implemented.
- 2) Personnel power to teach the core advanced nutrition courses
  - a. A total commitment to teach 6-8 credit hrs of instruction per year in advanced nutrition will be needed.
  - b. Each of the major departments will contribute about ½ of the personnel power needed to teach these core courses.
  - c. A faculty coordinator will teach 30-50% of the class.
  - d. Adequate expertise is available to teach these courses, although specific expertise in key areas is weak.
- 3) Personnel power to teach advanced specialty courses: Within each of the specializations, 2-5 focus courses will be taught. At the outset these courses on the books will be used to satisfy the specialization requirements.
  - a. A revamping of the specialization courses will occur quickly.
  - b. Combining the program provides expanded opportunities to fill gaps in the nutrition education program that are now not adequately covered by current faculty in both animal and human nutrition.
  - c. In an effort to focus on faculty hires that support NuSci, we propose to examine the program in detail and prioritize a list of faculty hires that can be used campus-wide in hiring faculty that fit into the NuSci program.
  - d. Faculty that need to be hired in the next few years include:
    - Energy metabolism/energetics and related nutritional concepts
    - Fat metabolism/carbohydrate metabolism
    - Gastroenterology expertise/gut physiology – for physiology course
    - Vitamin/minerals
- 4) Personnel power to oversee/manage the program
  - a. Faculty release time of ¼ time to oversee the program. The two major departments have agreed to support this concept if the Professor-in-Charge resides in their Department.



- b. Program Assistant to administratively support the program
  - c. Additional college/departmental support staff may be needed to meet the needs of the program.
- 5) **Infrastructure enhancements:** The NuSci program will continue operation with current facilities. Most nutrition research and teaching facilities are modern and state-of-the-art. However, to remain competitive and expand core areas of research two areas need to be expanded to accomplish the mission of the program and fully achieve our vision. Two focus areas are envisioned at the outset:
- a. **General Clinical Research Center (Human):** This expanded facility will include overnight stays, more extensive metabolic facilities, and an expanded off-campus facility that allows easy access for large numbers of subjects. This facility could be funded through a General Clinical Research Center (GCRC) grant in the future. To be eligible for these grants there must be a basic need generated from NIH-supported human work. In other words, there must be 4-5 human-related NIH grants funded at Iowa State to make a strong case for one of these centers.
  - b. **Center for Designing Feeds to Improve the Environment (CDFIE):** Over 85% of all crops grown in Iowa are fed to animals, which directly impact the environment. The proposed center would focus on changing the composition of corn and soybeans such that feeding to animals would reduce the animal's impact on the environment. It is anticipated that a federal and state initiative component would be part of the effort. The major emphasis of this project will be to remodel the existing 39 year-old animal nutrition laboratories in Kildee Hall.

## 11. Proposed Support from Departmental Chairs and College Deans on Resource Allocations, as Described in The Regents Questions

### A. **Animal Science**

- 1) Support release of NuSci Professor-in-Charge if from Animal Science
- 2) Two graduate student RAs (first year support) from nutrition pool
- 3) Faculty commitment to staff at least ½ of the core nutrition course and all the specialization coursework
- 4) Partial support (25%) for Program Assistant to manage the program

### B. **Food Science and Human Nutrition**

- 1) Support release of NuSci Professor-in-Charge if from FSHN
- 2) Two graduate student RAs (first year support) from FSHN pool
- 3) Faculty commitment to staff at least ½ of the core nutrition course and all the specialization coursework
- 4) Partial support (25%) for Program Assistant to manage the program

- C. **College of Agriculture (funds to be requested through departments)**
  - 1) Support of 2 graduate assistantships over the next 3 years
  - 2) Addition of 1 new nutrition faculty to support gaps in the NuSci program
  
- D. **College of Family & Consumer Sciences (funds to be requested through departments)**
  - 1) Support of 2 graduate assistantships over the next 3 years
  - 2) Addition of 1 new nutrition faculty to support gaps in the NuSci program
  
- E. **Graduate College (funds to be requested)**
  - 1) Support for 2 new assistantships starting in the fall of '05 and sun setting after 7 years
  - 2) Partial support (50%) for Program Assistant to manage the program
  - 3) Commitment to hire 1 new "initiative" faculty per year over the next 3 years (3 altogether) in support of the NuSci objectives

12. **Letters of Support and Recommendations – see Appendix A**

- A. **Programs at Other Regents Universities:** No other Regent institutions in Iowa offer undergraduate or graduate degrees in Nutrition.
  
- B. **Reports from Each Review Step**

## Regents Program Review Questions for New Majors

Name of the degree: Master of Science and Doctor of Philosophy

Name of the major: Nutritional Sciences

Contact person(s): Steven Nissen (An. Sci) and Diane Birt (FSHN)

### 1. Need

- a. How will this proposed program further the educational and curriculum needs of the students in this discipline?

The proposed program will improve education by providing a modern program in interdepartmental Nutritional Sciences that will offer a more comprehensive educational program to students pursuing the MS or PhD degree in interdepartmental Nutritional Sciences. The new curriculum is more diverse by involving faculty in several departments in instruction and spreading the educational process over several departments.

- b. How does it further the educational and curriculum needs of other units in the college or university?

Nutrition is an important component of several programs. The two main programs are in the FSHN department and the other is in Animal Sciences. The current degree programs in FSHN and Animal Science will be eliminated and students will be part of the NuSci program. Other programs such as HHP, Veterinary Physiology, and Biochemistry all have students who would be interested in a comprehensive advanced nutrition series of courses. Our expectation is that more total students will be taking the advanced nutrition series than are enrolled in the Interdepartmental Nutrition Program.

### 2. Duplication and Collaboration

- a. What programs in this field of study are available in other colleges and universities in Iowa?

There is no comprehensive program in interdepartmental Nutritional Sciences in the State of Iowa. No other program of nutrition is offered at the MS and PhD level in the State.

- b. With what representatives of these programs has there been consultation in developing this proposal? Provide a summary of the responses of each institution consulted.

None have been contacted.

- c. In what ways is this proposed program similar to those mentioned in 2a? In what ways is it different or does it have a different emphasis?

The proposed program is a research and technical degree rather than a professional practice degree. However, it is envisioned that many in the Nutrition Specialization of the Master of Family and Consumer Sciences (non-thesis) program at Iowa State will also take the advanced nutrition program.

d. How does the proposed program supplement the current programs available?

The proposed program replaces two existing programs at Iowa State. The NuSci program will replace MS and PhD nutrition programs in Animal Science and FSHN at ISU. The new program will supplement the campus-wide efforts in plant sciences, food safety, and other disciplines related to food and feed uses. In addition, the Health and Human Performance program will be enhanced by the program through providing research and support to efforts examining ways to alter nutrition to improve the health of people. A companion effort will be developed in animal nutrition areas to improve the environment.

e. Has the possibility of some kind of inter-institutional program or other cooperative effort been explored? What are the results of this study?

No. The large task of restructuring the nutrition programs on campus and new courses needed preclude concurrent expansion of the program to other institutions. This may be considered in the future.

f. Please list the Iowa institutions in which articulation agreements are being developed for the proposed program.

None

g. Please provide the Classification of Instructional Program (CIP) code for the proposed program.

Nutritional Sciences 26.0609

3. Please estimate the enrollment in this program for the next five years as follows:

a. Undergraduate

Not applicable

b. Graduate

i.	Current	42 Students in Animal Science & FSHN nutrition programs
ii.	end of 2005	50 Students in NuSci
iii.	2006	55 Students in NuSci
iv.	2007	60 Students in NuSci
v.	2008	60 Students in NuSci

1. On what basis were these estimates made?

The history of enrollment of nutrition graduate students is as follows:

<b><u>Enrollment year</u></b>	<b><u>Animal Science*</u></b>	<b><u>FSHN</u></b>	<b><u>Total</u></b>
2000	34	19	<b>53</b>
2001	29	22	<b>51</b>
2002	27	22	<b>49</b>
2003	25	20	<b>45</b>
2004	18	24	<b>42</b>

It is anticipated that increases in funding brought about by the invigorated program will allow expansion of the student numbers (our projected increase is stated above). Furthermore, the new program will have much greater visibility and our recruitment effort is expected to be much more effective.

\*The recent decline in Animal Science Nutrition graduate student numbers was due to several faculty retirements that decreased the number of faculty mentors for nutrition.

2. What are the anticipated sources of these students?

Although some ISU students will enter the program, it is anticipated that most graduate students will come from outside institutions. Peer institutions around the Midwest are the main sources for students.

4. Please provide any available data or information on employment opportunities available to graduates of this program in Iowa and nationally.

The current graduates of the human and animal nutrition programs are employed in a variety of jobs in Iowa and nationally. We anticipate little change in this pattern with the combined NuSci program. The students graduating from the new program will have a broader educational background such that they should be more competitive for a larger variety of jobs in both the animal and human market.

5. Are there accreditation standards for this program?

No

1. What is the accreditation organization?

Not applicable

2. What accreditation timetable is anticipated?

Not applicable

6. Does the proposed program meet minimal national standards for the program, e.g., Council of Graduate Schools or other such bodies?

Yes

7. Please report any reactions of the Iowa Coordinating Council for Post-High School Education. List date that the program information was submitted to the Council.  
No reaction solicited.
8. How does this program relate to the department's/college's/university's strategic plans?

In all cases this proposed program is directly or indirectly mentioned in the strategic plan. The University is keenly interested in improving educational quality and providing opportunities for economic development, which the proposed program enhances. The College of Agriculture has stated that forming the interdepartmental program in Nutritional Sciences is part of the strengthening activity in food and food safety. The two main departments involved in the program, Animal Science and Food Science and Human Nutrition, strongly support the program in their planning activities.

### **Additional Resource Needs**

Either question one or question two requires a "yes" answer. In addition to a "yes" response to one of the first two questions, question three and question four should be answered. If applicable, question five should be answered.

1. Will the program require new resources?                      Yes x                      No \_\_\_\_  
If "yes," what is the plan to obtain new resources?

Some resources have been reallocated to this program from the AnSci and FSHN departments. These departments have committed to requesting further reallocation at the college levels. Furthermore, to reach the vision of the Nutrition Sciences Council, it is anticipated that the new program will provide a platform for several new initiatives, which could possibly include:

- New NIH and USDA training grants
- New Clinical Research Center: Center for Designing Foods to Improve Nutrition has an excellent facility for research, but has limited support for nutrition/technical support. To be eligible for these grants, there must be a 4-5 human nutrition-related NIH grants funded at Iowa State to make a strong case for one of these centers.
- Establish a Center for Designing Feeds to Improve the Environment (CDFIE). The proposed center would focus on changing the composition of corn and soybeans fed to animals that will reduce the animal's impact on the environment. It is anticipated that a federal and state initiative component would be part of the effort.

- Enhanced Endowment: Campus-wide, nutrition currently has significant endowment resources (total of all programs is close to \$2M). Our goal would be to expand the endowment through corporate and personal gifts.
- New Industry Grants/Liaisons: Currently, many large nutrition-related companies are unaware of the opportunities at Iowa State. We need to do a better job of informing them of the opportunities for research collaborations at Iowa State.

2. Will the program require reallocated resources? Yes  No   
 If "yes," what is the university's reallocation plan to fund this program?

It is anticipated most of the funds requested will be part of the University reallocation process that is in progress. Reallocated funds will be needed for graduate students, clerical help, and to support release time for the Professor-in-Charge of the program.

3. At what level of enrollment will additional resources be required for the program?

At the enrollments anticipated in the initial years, resources and facilities are adequate.

4. Estimate the total costs (or *incremental increases in expenditures*) that may be necessary as a result of the new program for the next three years.

<b>Incremental Central Funding Needs</b> (the Essential/Required resources from pg 15)	<b>First Year</b> (starting F '06)	<b>Second Year</b>	<b>Third Year</b>
Graduate Assistants (6, 2 added in each of the next 3 years)	\$ 50,000	\$ 100,000	\$ 150,000
Program Assistant (0.5 FTE)	\$ 25,000	\$ 25,000	\$ 25,000
General Expense	0	0	0
Equipment	0	0	0
Library Resources	0	0	0
Computer use	0	0	0
Other resources	0	0	0
<b>TOTALS</b>	<b>\$75,000</b>	<b>\$125,000</b>	<b>\$175,000</b>


5. For programs planning to use external grants, what would be the effect of the grant termination?

Grant funding will allow us to recruit additional students. All students are expected to be on stipends. The basic program will provide additional funding for students who are selecting their home laboratory and department. Grant termination is not anticipated to affect the basic program.

**Department Support Letters:**

**IOWA STATE UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

To: Whom It May Concern:



From: Maynard Hogberg  
Professor and Chair

RE: Nutritional Sciences Program

This memo is written to support the Nutritional Sciences Program at Iowa State University. The Department of Animal Science faculty have been involved in the formation of this program and have voted to support the program concept. It is in the best interests of Iowa State University and nutritional programs on campus that this program move forward quickly to establish a strong, coordinated nutritional sciences program on campus.

If I can answer any questions, please feel free to contact me.

College of Agriculture  
Department of Animal Science  
1221 Kildee Hall  
Ames, IA 50011-3150  
Ph: (515) 294-2160  
Fax: (515) 294-6994



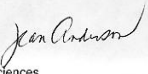
## Departmental Curriculum Committee Support Letters

IOWA STATE UNIVERSITY  
OF SCIENCE AND TECHNOLOGY

Interoffice Communication  
Department of Food Science and Human Nutrition  
1127 Human Nutritional Sciences Building PH: 294-4436 FAX: 294-6193

DATE: September 21, 2004

TO: Ruth MacDonald, FS HN Department Chair

FROM: Jean Anderson, FS HN Curriculum Committee Chair 

RE: Interdepartmental Graduate Program in Nutritional Sciences

The Food Science and Human Nutrition (FS HN) Curriculum Committee enthusiastically endorses the proposed Interdepartmental Graduate Program in Nutritional Sciences. This proposal has been approved by the department faculty. While the working committee continues to make minor revisions to the proposal as needed, the Curriculum Committee notes that the original intent and purpose of the proposal remains intact.

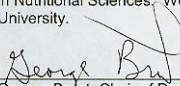
This proposal is an excellent example of interdepartmental collaboration and will provide enhanced opportunities for the students and faculty housed in FS HN.

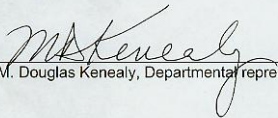
IOWA STATE UNIVERSITY  
OF SCIENCE AND TECHNOLOGY

College of Agriculture  
Department of Animal Science  
2356 Kildee Hall  
Ames, Iowa 50011-3150  
515-294-5849  
FAX: 515-294-4471  
george@iastate.edu

12 October 2004

The department of Animal Science fully supports the proposed interdepartment program in Nutritional Sciences. We believe this will enhance the study of nutrition at Iowa State University.

  
George Brant, Chair of Department of Animal Science Curriculum Committee

  
M. Douglas Kenealy, Departmental representative

**College of Family and Consumer Sciences curriculum  
committee support letter:**

Dear Kevin,

As you are aware, the College of Family and Consumer Sciences curriculum committee today approved the Proposal to Restructure Graduate Nutrition at Iowa State University. Thanks for presenting the proposal to our group; good luck as it moves through the appropriate channels.

Sedahlia Crase, Chair  
FCS Curriculum Committee