

New Brunswick Strategic Planning Proposal

Proposal Title:

“The Rutgers One Nutrition Initiative: A Pathway to Prominence”

Proposal Initiator:

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Primary Strategic Priority/Foundational Element/Integrating Theme Addressed

Primary theme indicated with a “1”. Additional themes indicated with an “X”.

- Envision Tomorrow’s University
- Build Faculty Excellence
- Transform the Student Experience
- Enhance Our Public Prominence
- Strong Core of Sciences and Humanities
- Inclusive, Diverse, and Cohesive Culture
- Effective and Efficient Infrastructure and Staff
- Financial Resources Sufficient to Fund Our Aspirations
- Robust Shared Governance, Academic Freedom, and Effective Communication
- Cultures, Diversity, and Inequality—Local and Global
- 1 Improving the Health and Wellness of Individuals and Populations
- Creating a Sustainable World through Innovation, Engineering, and Technology
- Educating Involved Citizens and Effective Leaders for a Dynamic World
- Creative Expression and the Human Experience
- Measuring Progress and Defining Success

Proposal Abstract: Nutritional science has a strong historical legacy at Rutgers that continues today across all schools and campuses. However, nutritional science-related research and education is mostly ‘siloe’d’ within departments, programs, and campuses, and there is limited interdisciplinary interaction among faculty and students. In addition, Rutgers is not currently recognized as one of the top tier academic institutions for nutrition research and education. It is therefore proposed that Rutgers pursue a strategy titled One Nutrition. The goal of One Nutrition is to increase interaction among individuals, departments, schools, and campuses across all of Rutgers to develop and maximize our ability to address the major nutrition-related problems of our times. One Nutrition will also serve as a brand by which nutritional science at Rutgers can be promoted on the state, national, and international stages. Activities will include intramural nutrition summits designed to incubate and catalyze interdisciplinary research and education; pilot grant competitions targeted to interdisciplinary research teams to address grand thematic areas; recruitment of thought leaders in key, interdisciplinary fields who can enhance, catalyze, and lead the future of nutritional science research; and development of a strong multimedia presence to promote our efforts and accomplishments. To coordinate these activities, a University-wide nutrition consortium will be formed and administered through the New Jersey Institute for Food, Nutrition, and Health. The primary goal of these efforts would be to identify and develop a *pathway to prominence* in nutritional science within the entire Rutgers family.

A. What is Being Proposed?

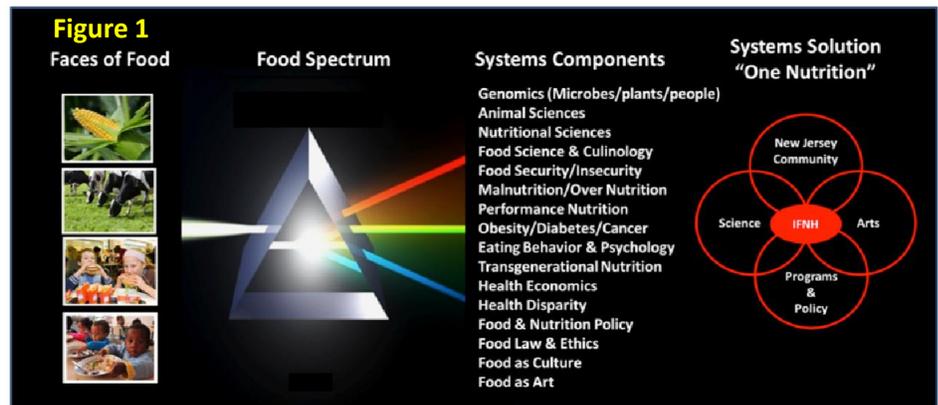
I. **Background:** Nutritional science is unique among the STEM disciplines. While there are fundamental core principles that underlie nutrition that make it distinct from other sciences, it is also a highly integrative endeavor that permeates and encompasses many academic fields and professions (**Figure 1**). The study of nutrition is concerned with everything, from individual nutrients to whole foods, and from the needs of the single cell to those of individual organisms and populations. It requires simultaneous understanding of basic molecular mechanisms and systems biology, as well as social, cultural, environmental, economic, and ethical factors and influences. Nutrition is fundamental to our existence, and especially the *quality* of that existence.

Nutritional science has a well-established legacy at Rutgers. Historically, land grant and agricultural schools, including Rutgers, have been primary contributors to our basic understanding of nutritional concepts stemming from the need to produce and grow healthy plants and animals for human consumption. A few examples from Rutgers history by pioneers in 20th century nutrition research include studies of vitamin K

and blood clotting by Dr. Paul Griminger; zinc metabolism by Dr. Robert Cousins; and the association between soluble fiber and atherosclerosis by Dr. Hans Fisher, founding Chair of the Dept. of Nutritional Sciences now within the School of Environmental and Biological Sciences (SEBS).

Today, this legacy of nutritional science research continues within SEBS and the Graduate School – New Brunswick, not only in the Dept. of Nutritional Sciences, but also in the Depts. of Food Science, Animal Science, and Exercise Science, and their affiliated graduate programs (i.e. the graduate programs in Nutritional Sciences, Food Science, and Endocrinology and Animal Biosciences). While current efforts among these departments and graduate programs continue to pursue cutting-edge basic and preclinical research, they also extend into translational and applied human research, with programs led by the Dept. of Nutritional Sciences and the Dept. of Family and Community Health Sciences within the Rutgers NJ Agriculture Experiment Station. The NJ Food Stamp Nutrition Education Program (FSNEP), the education component of the Supplemental Nutrition Assistance Program (SNAP-Ed), and the State Expanded Food and Nutrition Education Program (EFNEP) are coordinated and administered through the Dept. of Nutritional Sciences, and there is extensive involvement of Rutgers faculty with community-oriented programs such as the New Brunswick Farmers Market and the Nutritional Sciences Preschool. The NJ Obesity Group (a multi-disciplinary team of investigators) was initiated and still functions out of the Dept. of Nutritional Sciences. Moreover, Rutgers has demonstrated a commitment to nutrition as a key programmatic initiative with the funding and development of the NJ Institute for Food, Nutrition, and Health (IFNH). Construction of the 80,000 sq. ft. building that will house the IFNH is on target for completion in June 2015. Not only is the building transforming the landscape of the New Brunswick campus, it will transform our ability to carry out human-oriented, interdisciplinary nutrition research.

II. **Problem Statement:** Notwithstanding the legacy at Rutgers and the current active and thriving programs with foci in nutrition, it is put forward for consideration herein that nutritional science at Rutgers in the 21st century can be much more than it is. The current state of affairs is that research and educational activities in nutritional science are ‘siloed’ within departments, programs, and campuses. This has been accentuated by the integration into Rutgers of the former University of Medicine and Dentistry of NJ, which has brought additional foci of nutrition research and education under Rutgers’ aegis (including a second Dept. of Nutritional Sciences with an emphasis on dietetics and clinical nutrition within the Rutgers Biomedical and Health Sciences School of Health Related Professions [RBHS SHRP]). The consequences of such fragmented efforts include limited communication and research collaborations among researchers, and potential duplication of educational efforts. In addition, it limits external visibility of Rutgers as a vibrant and influential center for nutritional science research and education at state, national and global levels. As such, though some Rutgers individuals and programs are nationally and internationally recognized for their research and educational



accomplishments, Rutgers is not widely considered to be a top tier institution for nutrition research and education. In short, Rutgers lacks brand identity in this area.

It is therefore imperative that concerted, integrative action be taken to bring together the various foci of nutritional science and begin to establish a united framework for associated, interdisciplinary research and education at Rutgers. The primary goal of these efforts would be to identify and develop a Pathway to Prominence in nutritional science within the entire Rutgers family.

III. The One Nutrition Initiative: To address this goal, it is proposed that Rutgers pursue a strategy dubbed One Nutrition. The concept of One Nutrition is an offshoot of the concepts of 'One Medicine' or 'One Health'. One Health refers to an interdisciplinary approach based on the recognition that human health, animal health, and the health of our shared ecosystems are interdependent. It is by definition an integrative approach that not only merges basic and clinical research in the biological and biomedical sciences, but also research in disciplines not traditionally thought of as biological, such as economics, sociology, and public policy. Examples of One Health programs can be found at <http://www.vetmed.ucdavis.edu/ohi/> and <http://research.vet.upenn.edu/Default.aspx?alias=research.vet.upenn.edu/pennvetphd>.

Similarly, One Nutrition is based on the recognition that nutrition is not only essential to human and animal health, but that human and animal nutrition are interdependent and dependent on a healthy environment. It also recognizes that integrative basic and clinical nutrition research is necessary for establishing responsible public policy that is evidence-based and effective in promoting healthy eating and nutritional awareness. Importantly, the overall goal of One Nutrition is not to impose predetermined lines of investigation and educational strategies, but instead to increase interaction among individuals, departments, schools, and campuses across all of Rutgers such that interdisciplinary programs and projects can develop organically, thus increasing our ability to address the major nutrition-related problems of our times. One Nutrition would also serve as a brand by which nutritional science at Rutgers can be promoted on the state, national, and international stages, limited only by the intellect and will of the faculty, students, staff, and administration.

IV. Specific Aims:

1. Promote interdisciplinary, collaborative, and translational research across all three Rutgers campuses.
2. Refine and develop interdisciplinary curricula in nutritional science that serve the undergraduate, graduate, and professional education needs of the 21st century.
3. Promote and increase the visibility of nutritional science at Rutgers.

V. Plan of Action: For Specific Aims 1 and 2, the primary goal is to provide the incubator and the catalyst to promote interdisciplinary engagement in research and education. Currently, initiation and development of such collaborations with respect to nutritional science occurs at Rutgers mainly on an *ad hoc* basis. To significantly increase opportunities for interdisciplinary, collaborative interaction, the following is proposed:

- Nutrition Summits: The primary incubator of the Rutgers One Nutrition Initiative will be summit meetings of representatives from all programs (all schools and campuses) involved in nutritional science research and education. In year 1, there will be two summit meetings, one for research and one for education. The agendas for these initial meetings will primarily focus on programmatic presentations describing current nutritional science related research and education activities. These initial meetings will also have the goal of identifying grand thematic areas that can best be addressed by interdisciplinary teams of researchers and educators. The process would be a grass roots, organic effort that would allow for subgroups to coalesce around themes as they develop. The following are some examples of grand thematic areas that could develop from this process:
 - *Nutrition and Developmental Origins of Health and Disease.* Recent advances in epigenetics have revealed the putative mechanism by which diet and nutrients during the *in utero* and post-natal periods affect the phenotype of the child and his/her health and wellness into adulthood.
 - *Foods, Nutrition, and Gut Microbiota.* Gut microbiota are now recognized as important determinants of body composition and other phenotypic characteristics that are potentially modifiable by diet and nutritional factors.
 - *Nutrition and Disease Prevention.* Age-associated degenerative diseases are influenced by diet including diabetes, cardiovascular disease, cancer, neurodegenerative disease, and bone disorders.
 - *Personalized Nutrition.* The 'omics' era (genomics, transcriptomics, metabolomics, etc...) now makes it possible to move from population-based dietary recommendations to personalized nutrition.

- *Foods, Nutrition, and Health from Plants to Animals to People.* One Nutrition recognizes the interconnectedness of the health of plants, animals, people, and the environment. It also recognizes current efforts using *food systems approaches* to solve issues of delivering food from the field to the plate while simultaneously considering issues of public health, equity, and the environment.
- *Food Insecurity.* Limited access to food and poor food choices put people on a path to chronic disease and social marginalization. Within NJ, children are particularly at risk with ~400,000 children forced to make food choices in which cost and staving off hunger trump proper nutrition.
- *Performance Nutrition.* Whether a dance major or a student athlete, optimized nutrition promotes higher performance and reduced risk of injury. Biometric testing of dancers is one example of the collaborative possibilities between performing arts, exercise science, and nutrition that can prove beneficial to professional and recreational dancers of all ages.
- *Food Law and Policy.* NJ ranks #2 in the nation in class action law suits, and it is home to a \$105 billion food industry. Law and policy are guiding emerging ethical frameworks with respect to food.
- *Food and Society.* Film students at Rutgers are capturing how NJ is coming together to fight obesity and develop a culture of health. Digital narratives, social media and community impact models are becoming increasingly important as systems levers of change.
- *Citizen Science and Public-Private Partnerships.* There is an ever-increasing involvement of non-scientists as thought-leaders in the debate and direction of food policy. Investigative journalism is an excellent example of this trend. There also is an increasing reliance on funding of science by private corporations and individuals.

Importantly, it is emphasized that these are examples, and that a characteristic of the Nutrition Summits would be receptiveness to all ideas. In subsequent years, the Nutrition Summits would recur yearly and would serve as a forum to review progress, promote accomplishments, and to incubate new themes and ideas. These summits could also be expanded to include guests and attendees from institutions outside of Rutgers. Ultimately, it is anticipated that the Nutrition Summits could be expanded into regional, national, and international conferences. A model for this is the Sackler Institute for Nutrition Science within the New York Academy of Sciences (<http://www.nyas.org/WhatWeDo/Nutrition.aspx>).

- Leveraging the Institute for Food, Nutrition, and Health: The IFNH will play a central role in facilitating the One Nutrition initiative. Specifically, the IFNH will provide the capacity to perform translational, human-oriented research on the New Brunswick campus in a new, state-of-the-art facility. Immediate implementation of the following goals of the One Nutrition program will allow the IFNH to be fully functional when the building opens in 2015:
 - *Clinical Chemistry and Analytical Laboratory.* Important for human subjects research is access to basic clinical chemistry and analytical laboratory services. A goal for the IFNH and the One Nutrition initiative is to develop a core facility that can provide these services. It is envisioned that development of this service will include recruitment of an academic leader for the core. A model for this is the Nutrition Evaluation Laboratory at the Tufts University USDA Human Nutrition Research Center on Aging (<http://hnrca.tufts.edu/research/scientific-services/nutrition-evaluation-laboratory/>).
 - *Professional Training.* The IFNH offers a unique setting for training healthcare professionals including registered dietitians, nurses, physicians, public health practitioners, and social workers. Additionally, the modern shared space research laboratories with open office configurations offers students the opportunity to learn and interact in a real world environment already common in the private sector. Notably, 61% of STEM graduates now find employment in non-academic organizations.
 - *Cohort Recruitment.* Access to human subjects will be essential for promoting interdisciplinary research. It is therefore proposed, as a central component of the One Nutrition initiative, to recruit human cohorts that would be studied within the IFNH facility. Models for such cohorts include the Framingham Heart Study, the Physician's Health Study, the Nurses' Health Study, the Women's Health Initiative, and the National Health and Nutrition Examination Survey. Examples of potential cohorts that could be studied at Rutgers include: 1) a children's cohort to investigate the factors underlying childhood obesity and future health and wellness, 2) a Rutgers undergraduate student cohort to investigate the influences of diet and other factors on health and wellness through the

college years, and 3) an older adult cohort to investigate the influences of diet and other factors on age-associated degenerative diseases such as Alzheimer's disease and osteoporosis.

- *Community Outreach.* The NJ Department of Health has just released its chronic disease prevention plan. Notably, it identifies improved nutrition and increased physical activity with a focus on children in low-income households as a major emphasis. The IFNH with its Center for Human Performance and Center for Childhood Nutrition and Education Research can partner with the new School of Public Health to better position Rutgers to serve this plan. In this regard, a leadership role of the IFNH through Rutgers Cooperative Extension and emerging community impact models offers a channel to translate One Nutrition to practice in the community.
- Formation of a One Rutgers Consortium: The One Nutrition proposal and recommendations from the RBHS nutrition working group are converging on the need for a central organizing body, a nutritional consortium that integrates and enables nutrition across the university. It is proposed that this initiative be included in the charter and responsibilities of the IFNH. As a university-wide enterprise having 1) a leadership board consisting of chancellors and deans from across the university, 2) a modern new building scheduled to open in the summer of 2015, 3) partnerships with dining services and student health, and 4) a culture of interdisciplinarity and teamwork, the IFNH can be a cornerstone of the Pathway to Prominence for nutritional science at Rutgers.
- Pilot Grant Program: Pilot grants are a proven effective method for promoting interdisciplinary research. Accordingly, a key component of the One Nutrition initiative will be a yearly pilot grant competition with an emphasis on proposals that include lead investigators from at least two distinct disciplines, are innovative and interdisciplinary in nature, and have a high potential to lead to high profile, externally funded projects.
- Recruitment of Henry Rutgers Professorships: It is envisioned that the One Nutrition initiative will serve as a recruitment tool for thought leaders in key, interdisciplinary disciplines who can enhance, catalyze, and lead the future of nutritional science research at Rutgers. Examples of potential cross-cutting disciplines that would enhance our objectives are epigenetics, gut microbiota, metabolomics, functional and designer foods, systems biology, and bioinformatics.

For Specific Aim 3, the focus will be on leveraging One Nutrition as a brand to promote nutritional science research and education at Rutgers. Goals of this specific aim include increasing the reputation of the University in the eyes of funding organizations as a leader in preclinical, translational, clinical, and applied nutrition research and in so doing improve prospects for major grant funding; increase visibility of nutritional science to attract top-rated students; attract alumni support and donations; and promote our programs and successes to the general public. We hope also to serve as a role model for other Rutgers programs that are interested in enhancing their national and international presence. Examples of promotional activities include:

- Developing a Multimedia Presence: The goal will be to develop the Rutgers One Nutrition brand by expanding and enhancing our multimedia presence. This will include publications such as electronic newsletters for wide distribution, and a new "Rutgers Nutrition" or "Rutgers Food and Nutrition" magazine in the mode of the "Rutgers" magazine targeted to alumni and friends, the "Tufts Nutrition" magazine (<http://nutrition.tufts.edu/publications/magazine>), and the "Johns Hopkins Public Health" magazine (<http://magazine.jhsph.edu/2014/food/>). Social media (e.g. Facebook, Twitter, YouTube, blogs, and other modes of communication) will be exploited to enhance interactions with students, the academic community, alumni, and the outside world. Video will be utilized to tell professional stories about food and nutrition-related topics at Rutgers through a partnership with the Center for Digital Film Making in the Mason Gross School of the Arts, led by Dena Seidel. The documentary "A Generation at Risk" is an example of what has already been produced in this regard (<http://www.masongross.rutgers.edu/content/generation-risk-joining-forces-fight-childhood-obesity>). Nutrition TED talks would also be considered (<https://www.ted.com/talks/browse>).
- Virtual Alumni Classroom: Consideration will be given to creating a virtual alumni classroom. Faculty lectures could be recorded and made available online, with accompanying discussion questions. Alumni and others would be encouraged to respond to the questions and to each other's comments in

an online forum. The goal would be to provide alumni with a chance to continue engagement with Rutgers at the academic level.

B. Alignment with the University Strategic Plan, Additional Themes, and Priorities: One Nutrition hits on many of the strategic priorities laid out in the University-wide strategic plan (*italicized* below). The primary integrating theme addressed by One Nutrition is *improving health and wellness of individuals and populations*. In this regard, One Nutrition embraces the parallel strategic plan proposals being developed by the nutrition and obesity committees of RBHS that focus primarily on the medical and public health aspects of food, nutrition, and health. However, One Nutrition goes beyond medicine and public health to include all aspects of food and nutrition and their impact on quality of life. In addition to prioritizing basic biology and the interconnectedness of plants, animals, humans, and the environment, One Nutrition will consider through a broad perspective how food and nutrition intersect with societal factors and influences, including but not limited to: the roles food and nutrition play in diverse cultures through celebrations of heritage; the roles that food and nutrition play in the enhancement of creative expression and human performance, allowing performing artists and athletes to maximize potential; and the roles of food and nutrition as inextricable components of societal justice and equality. In this way, One Nutrition *envision tomorrow's university* as a dynamic entity that *transforms the student (and faculty) experience* by incubating and catalyzing innovative, interdisciplinary interaction. This will *build faculty excellence* by expanding opportunity for current faculty and attracting new faculty who are interested in contributing to and leading nutritional science through the 21st century. One Nutrition will also *enhance our public prominence* through development of a 21st century multimedia presence and creation of alumni classrooms.

C. Who is Involved: Department Chairs and Institute and Center Directors from 3 schools have reviewed this proposal and acknowledge their support (alphabetical order): Carol Bagnell, PhD (Chair, Animal Science); Peter Gillies, PhD (Director, IFNH); Mukund Karwe, PhD (Chair, Food Science); Kathleen Morgan, DrMH, DTR (Chair, Dept. of Family and Community Health Sciences); Julia Ritter, MFA (Chair, Dept. of Dance); Dena Seidel, MA (Director, Rutgers Center for Digital Film Making); and Sue Shapses, PhD (Acting Chair, Exercise Science and Sport Studies).

D. Desired Outcomes:

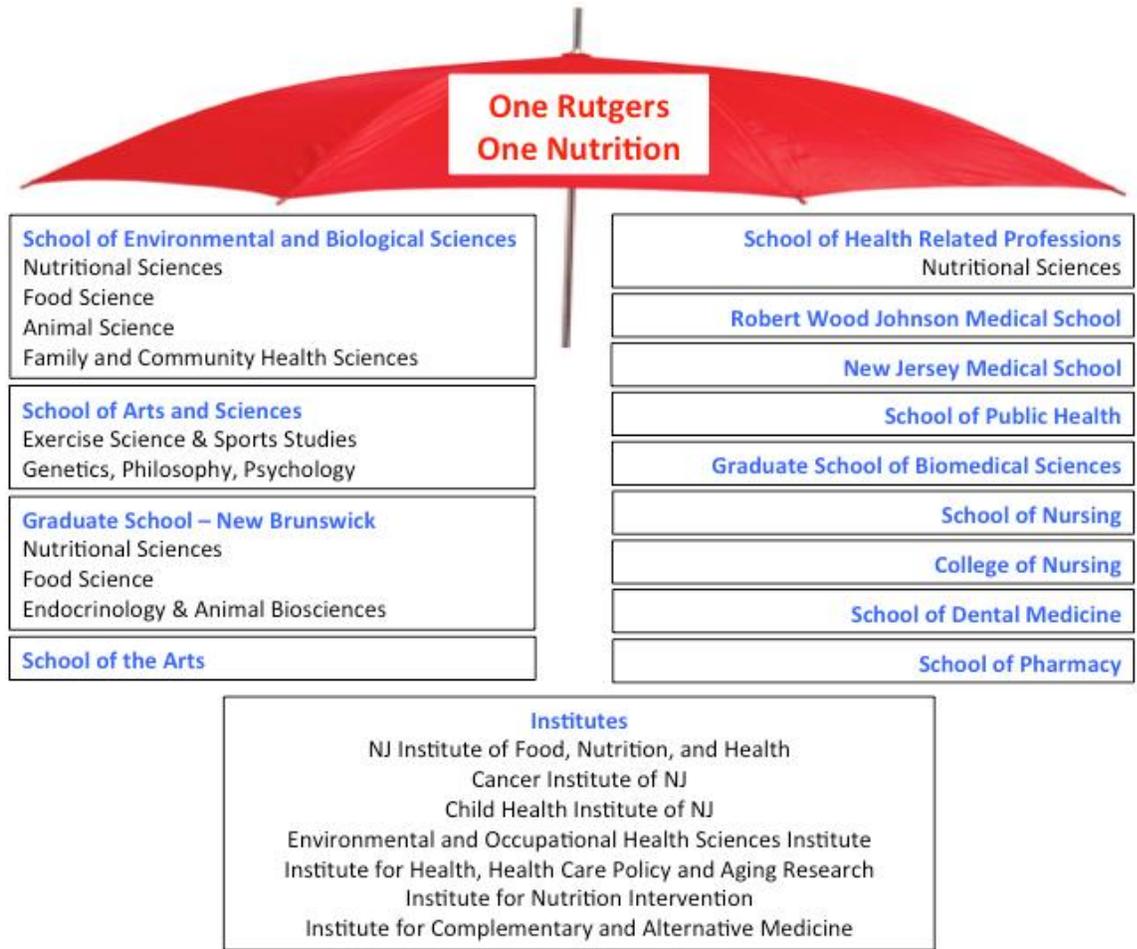
- Initiation of Nutrition Summits to develop and catalyze the future of nutritional sciences at Rutgers.
- Formation of the Rutgers One Nutrition Consortium.
- Leveraging the IFNH as a lead institute and facilitator of the One Nutrition initiative.
- Establishing a sustainable pilot grant program that leads to development of interdisciplinary research teams and highly competitive grant proposals to national funding agencies that address the major nutrition-related issues of today and tomorrow.
- Recruitment of internationally recognized thought leaders in disciplines that will be integral to the future of nutritional science research and education (Henry Rutgers Professorships).
- Transformation of the student experience through development and refinement of nutritional science-related curricula and expansion of undergraduate and graduate research opportunities.
- Promotion of the Rutgers One Nutrition brand by developing and expanding our multimedia presence.

E. Resources Required: It is recognized that the One Nutrition initiative is ambitious and full implementation will require significant resources. Long-term support to sustain the initiative would be sought from government, foundation, industry, and philanthropic sources after initial establishment of the program. The source of funding will likely be dictated by the specific need (e.g. pilot and training grants from government and industry; nutrition summit sponsorships from industry; university funds for faculty recruitment; alumni and friends of Rutgers for video productions). To jump-start the One Nutrition initiative, the following resources are required:

- Intramural Nutrition Summits (two per year): Venue, food, and promotional costs - \$15,000/y for 3 years
- Pilot Grant Funding: \$50,000 - \$100,000/year for 3 years
- Administrative Staff Position: Various duties will include coordination of the One Nutrition consortium and nutrition summits; coordination of the pilot grant program; development and maintenance of the multimedia presence; and assistance in faculty and student recruitment for video productions and creation of the virtual alumni classroom - \$60,000/y for 3 years.
- Video Production Costs: \$10,000/y for 3 years

F. Proposed Measures to Mark Progress or Determine Success: The time frame for implementation of the One Nutrition initiative will be 3 years. Overall success of One Nutrition will be measured by objective outcomes including the following:

- Establishment of the Rutgers One Nutrition Consortium.
- Number of interdisciplinary research teams created.
- Number of pilot grants awarded to interdisciplinary research teams.
- Amount of research funding awarded from government, foundational, industry, and philanthropic organizations calculated as the return on investment in pilot grants.
- Number of Henry Rutgers Professors and other new faculty recruited and retained.
- Number of new general education and advanced courses created or revised.
- Number of students enrolling in food and nutritional science-oriented classes as majors and non-majors at the undergraduate, graduate, and professional levels.
- Number of professionals trained in food and nutrition-oriented degree programs.
- Publishing of Rutgers food and nutrition-oriented newsletter and magazine.
- Number of videos produced highlighting research by faculty and students.
- Establishment of a social media presence.
- Creation of a virtual alumni classroom.
- Number and amount of donations from alumni and other friends of Rutgers.



Please save your proposal as a Word document and submit it as an email attachment to NBStratPlanProposals@rutgers.edu by April 15, 2014.