



Food Innovation Center

Collaborating for a healthier, hunger-free world



Respectfully submitted by

- Director* **Ken Lee**, Professor, Food Science & Technology
- Associate Directors* **Steve Clinton**, Professor, Internal Medicine
- Mark Failla** Associate Dean for Research, College of Education and Human Ecology; Professor, Human Nutrition
- Michael Leiblein**, Associate Professor, Strategic Management
- Steve Schwartz**, Professor and Carl E. Haas Endowed Chair, Food Science & Technology
- Staff* **Carolee Barber**, Executive Manager, Food Innovation Center
- Alex Barkley**, Program Manager, Centers for Innovation, 50% FIC
- Meg Dick**, Budget Analyst, Centers for Innovation, 50% FIC

Contents

- I. Executive Summary..... 2
- II. Accomplishments to date narrative..... 2
- III. Efforts to address concerns or misperceptions..... 4
- IV. Integration progress and implementation efforts..... 5
- V. Evidence of the success of the governance structure or adjustments made..... 10
- VI. Evidence that goals and objectives are achieved--direct results..... 11
- VII. Personnel changes and how they have been addressed..... 14
- VIII. Data for your adopted metrics to gauge the success of the CI..... 14
- IX. Budget summary of sources and uses of funds for first two years..... **Error! Bookmark not defined.**
- X. Appendices..... **Error! Bookmark not defined.**

*Reporting period: April 1, 2011–April 30, 2012

I. Executive Summary

Being at the right place at the right time with the right people is rare, perhaps a once in a lifetime event. The members of the Food Innovation Center are the right people to implement an unprecedented priority in Food Production and Security, one of the university's three discovery themes. By design, the food discovery theme builds upon "uniquely broad and deep institutional expertise and reflects key issues that both face society today and will need to be addressed well into the future," said Provost Alutto in his senate address 2012. Vice President Whitacre points to the \$91 million in expenditures in FY12 by Ohio State food researchers. The state of Ohio recognizes our campus is an exclusive center of excellence in Agriculture, Food Production & Bioproducts. Ohio State is the right place to provide world leadership in a vital global need. Our investment of \$750,000 per year is returning large dividends. In just our first two years, teams directly supported by FIC are directly responsible for a total of \$51,090,137 in extramural grant requests and have successfully won awards of \$7,590,703 (details in VI.E). Membership has more than doubled as the right people at Ohio State seek to help food discovery. Now every OSU college actively engages FIC with 70% of members outside of traditional agriculture disciplines (pie chart in III). More importantly, a larger percentage of awards now support non-ag disciplines, with all awards requiring collaboration across two or more college boundaries. Investment in food is here to stay, as five faculty searches have directly involved FIC (list in IV.C) as many deans and vice-presidents invest strategically in our food future. With a projected nine billion people on our planet by year 2050, the current generation of science will be responsible for feast or famine, prosperity or poverty, peace or war. What Ohio State Food Innovation achieves now is the foundation for our food future. The members of the Food Innovation Center are pleased to present this roster of accomplishment that embodies One University and place us at the right time to do something great.

II. Accomplishments to date narrative

The Food Innovation Center has succeeded in expanding engagement across the university, investing in impactful activities, developing partnerships and sustainability, and fostering collaborative networks.

A. Expanding engagement across the university

All 14 Ohio State colleges now have members in the center, see Appendix A. Faculty members, staff, and graduate students from across campus seek to affiliate. As this table indicates, FIC's human capital has more than doubled in one year:

Food Innovation Center membership growth continues

	Members	Colleges	Funded Investigators
Yr 0 Proposal	86	11	0
Yr 1 Annual Report	121	13	50
Yr 2 Annual Report	250	14	114

A robust membership roster is an indicator of FIC vitality. The center also advances in higher order indicators of engagement such as member participation and outputs. Members from 13 colleges are on our funded teams, with measurable results.

B. Investing in impactful activities

FIC wisely invests the funds entrusted to us by OAA and OR, as shown in our budget section IX. Return on investment in themes of importance to the university and the center are evident. While most investments require several years to measure impact, several of our early investments now show fruit:

- More than **\$7.5 million** in extramural funding is won by FIC teams, with several million pending.
- Commercialization impact includes an invention disclosure, one submitted and one planned SBIR application, and a \$3 million Ohio Third Frontier award.
- Dissemination of knowledge through 10 peer-reviewed publications, 39 presentations, and 11 honors and awards, per section VI.
- Student achievements including two Pelotonia fellowships and eight publications.
- Our Graduate Student Travel Awards supported 16 students presenting at major national meetings including Experimental Biology and the Society of Behavioral Medicine (Appendix B). These experiences train the students and raise the stature of Ohio State's food system discovery theme.
- \$5,000 enabled FIC faculty mentorship of Metro and Westerville Central high school students. Mark Failla organized research mentorships for thirteen students. Student feedback reveals we help inspire the next generation of food innovators. More feedback is provided in Appendix C.

"My time with Dr. Kennel helped me decide OSU is the school I want to be at this fall. Ohio State offers phenomenal academic opportunities that I can't wait to take advantage of..." — Hannah Hart, Westerville Central HS, mentored by Dr. Julie Kennel

C. Developing partnerships and sustainability

The FIC is a very attractive resource. An executive of a fortune 500 food company said when he heard of FIC, "it's a no-brainer to work with you, instead of shopping around for the expertise I need." Several internal and external organizations view this center as the preferred portal into the university's food expertise. Highlights:

- FIC has a partnership with Abbott as part of the company's substantial philanthropic initiative in Haiti. FIC is helping to find new solutions for reducing and preventing malnutrition by evaluating viable crop ingredients and formulating fortified foods that will be locally sourced and produced in Haiti, providing both nutritional and economic benefits to the Haitian people. (Vodovotz, Y, Kleinhenz, M., Lee, K., Schwartz, S. An Industry-University Partnership for Innovative Malnutrition Solutions in Haiti. Abbott. \$213,383 / 1y. Funded December 2011.)
- FIC leadership met with many external stakeholders: Nationwide Board Council, Ohio Farm Bureau Federation, Mead Johnson Nutrition, Nestle, Cargill, Kaneka Nutrients, Stokes Family Farm, Ohio Dept. of Development, Mid-Ohio Foodbank, Peter Klein from McQuinn Center for Entrepreneurial Leadership, Wornick Foods, Three Family Farms, and Crimson Cup. Outcomes included funded

projects, collaboration on food security efforts, and an upcoming social science conference described in IV.F.

- FIC co-sponsored a major obesity symposium with Nationwide Children's Hospital (see IV.D.)
- Collaborations with other OSU centers include a joint RFA with the Center for Clinical and Translational Science announced May 11, 2012, and a successful \$3 million Third Frontier project with the Ohio Bioproducts Innovation Center.

Sustainability: The center is engaged in discussions with its board about sustainability and is strategizing with Dinessa Solomon, Director of Foundation Relations, about paths to foundation support. A new FIC staff position was created to facilitate high dollar, complex interdisciplinary proposals (see VII.)

D. Fostering collaborative networks

The center is a matchmaker for collaborations that elevate scholarly activities centered on food. Through meetings, pilot funding, proposal facilitation, introductions, networking our website, and our new infrastructure initiatives, FIC helps connect experts. Examples include:

- Second annual meeting, Sept. 8, 2011 (breakout topic groups were incentivized by a follow-up funding competition).
- Three funding programs offered in this reporting period, described in detail in IV.
- FIC organized participation in a USAID webcast and an interest meeting for their Higher Education Solutions Network RFA. Two of three OSU pre-proposals had FIC involvement.
- An FIC seed grant wine and cheese reception, April 2011, formed several new collaborations in anticipation of our 2011 seed competition.
- Two new FIC initiatives were developed providing leadership and coordination of efforts in **obesity** and in **food security** (see IV.E.).
- The FIC [website](#) was converted from Drupal to ModX software to help members find collaborators. Web analytics showed member profiles were frequently viewed, so the new ModX site features powerful profile content and discoverability, expediting internal and external awareness of university-wide food expertise.
- The FIC *foods for health* theme is advanced through the Center for the Advanced Functional Foods Research and Entrepreneurship ([CAFFRE](#)). CAFFRE meetings include faculty and trainees from across campus, providing FIC members with in-depth interaction regarding development of novel food products that target disease and promote health. Outputs this year include collaborative NIH and USDA grants, multiple publications, invention disclosures, trademarks, and a patent.

III. Efforts to address concerns or misperceptions

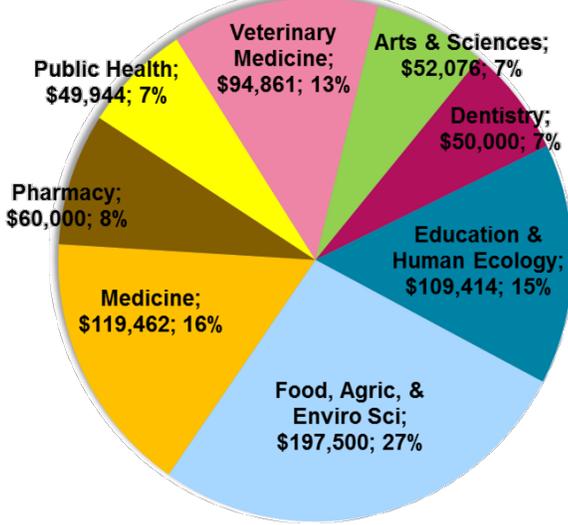
Perception: The Food Innovation Center has restrictive membership.

Fact: Membership is open to any faculty, staff, or graduate student at Ohio State as evident in our nonrestrictive membership [guidelines](#). FIC has members from **all 14 colleges** and two branch campuses, as shown in the following membership pie chart.

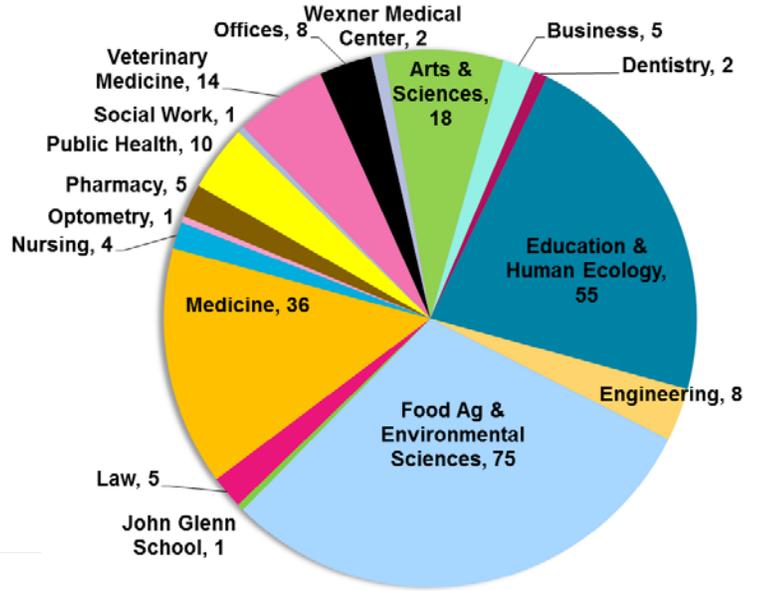
Perception: The FIC’s activities are mostly in agriculture or FAES.

Fact: The membership pie chart shows **70% of our members are not from FAES**. The distribution of competitive awards by PI’s college in the other chart demonstrates FIC support is well diversified across campus, spanning eight colleges.

Competitively funded awards by PI college, \$733,257 total



FIC faculty and associate members by college, n=250

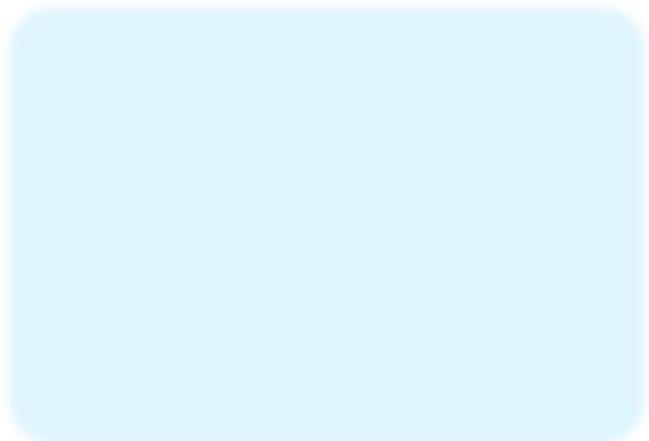


Offices (8) above are members from the Office of Business and Finance, Office of Health Sciences, and the Office of Research.

IV. Integration progress and implementation efforts

[Progress of integrating efforts across traditional boundaries is combined with Implementation issues that have emerged and steps taken to accommodate those issues because the answers are better understood in one integrated section IV.]

FIC has intensified reach across traditional boundaries advancing integration essential to achieve our mission. Internal funding standards, invitations to participate in key faculty searches, and emerging external partnerships point to progress. Planned and newly launched initiatives help surmount coordination challenges inherent to trans-disciplinary work.



A. Multi-college requirement for funded teams and outside partners encouraged

All four research RFPs this year required **multi-college teams**:

- **Seed grants 2011 and 2012:** Faculty members from two colleges (\$25,000 max/award). Note that the 2012 grants will be awarded July 1.
- **Team awards 2011:** FIC members from at least two colleges (\$2,500 max/award)
- **Innovation Initiatives 2012:** Faculty members from three colleges corresponding with a larger budget (\$50,000 max/award)

With our multi-college expectation, FIC engaged 13 colleges and several external organizations such as the Mid-Ohio Foodbank, Columbus Neighborhood Health Center, University of Ngaoundere (Cameroon), and Viocare, Inc. The table below conveys the trans-institutional composition for three competitive FIC programs and shows the reach of FIC's investments. RFPs and awardee lists are in Appendices D–G.

FIC Competitively Funded Teams in 2011-12			
College or VP unit	Seeds 2011	Team Awards 2011	Innovation Initiatives 2012
Arts & Sciences	1	3	2
Business	1		
Business & Finance		1	
Dentistry		1	1
EHE	9	17	1
Engineering	2	2	
FAES	10	13	4
Law		3	
Medicine	4	16	6
Nursing	1	2	2
Office of Health Sciences			1
Wexner Medical Center		1	
Pharmacy	3		
Public Health	2	5	
Social Work			1
Veterinary Medicine	1	1	2
<i>Outside OSU</i>		4	8
Total per competition	34	69	28

Total unique participants in all teams: 114

B. Expanding cross-campus membership and engagement

Adding a year 2 column to a table we presented last year reveals good progress:

Uptick in college counts reveal integration progress	
Year 1 (2010–11)	Year 2 (2011–12)
8 colleges on seed grant teams	13 colleges on funded teams
10 colleges with participants in first annual meeting	11 colleges, 1 school, and 8 external organizations participated in second annual meeting
13 of 14 colleges with FIC members	All 14 Ohio State colleges with FIC members

C. Faculty searches

FIC helped faculty searches that build food expertise in key areas at Ohio State.

1. **College of Social Work:** Ken Lee and Carolee Barber interviewed Michelle Kaiser, a candidate with food security expertise. Michelle was hired for fall 2012 and is already part of an FIC-funded team. This hire has provided a platform for increased engagement from a college that will provide important social and behavioral insight into complex food problems. Dean Tom Gregoire, also an FIC member, is currently developing a food security theme for CSW student interns.
2. **John Glenn School of Public Affairs:** Director Charlie Wise invited Ken Lee to serve on the search committee for food policy positions. Two faculty members will be joining the school this fall and are already associated with FIC.
3. **EHE:** Codirectors Steve Schwartz, Ken Lee, and Mark Failla interviewed candidate Rich Bruno this May 2012 for a human nutrition diet assessment faculty position.
4. **FAES:** Codirector Schwartz serves and Lee is chair of the search committee for an endowed professor in food engineering.
5. **FAES:** Codirectors Clinton and Schwartz serve on the search committee for the Dean and Vice President for Agricultural Administration.

D. Obesity symposium connects multidisciplinary experts, educates trainees.

FIC and Nationwide Children's Hospital (NCH) co-sponsored **Obesity and Chronic Disease: Making and Unmaking the Epidemic** at the Blackwell on November 1 and 2, 2011. FIC and NCH linked clinical, basic science, policy, and industry representatives, providing a well-received forum for a holistic exploration of obesity. High points:

- 253 participants, including 54 FIC members.
- Keynote by Dr. David Kessler, former Commissioner of FDA.
- Three half day sessions: *Childhood Obesity and Adult Disease*, *The Doing and Undoing of Extreme Obesity in Teens and Adults*, and *Public Health and Industry Partnerships*.
- Continuing education credits available for physicians, nurses, and dietitians.
- Workshop on day two with 53 participants including OSU Extension Specialists, Dietetic Interns, graduate students, and staff from Columbus Department of Public Health and the Franklin County Women, Infant and Children's (WIC) Program interacting with industry and communications experts.

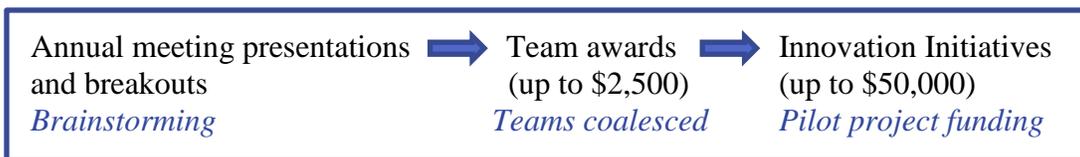
- Fourteen trainees and staff worked in three cross-functional teams to develop their grant writing skills at a post-conference workshop led by FIC members Mark Failla, Bob Murray, Karen Bruns, Julie Kennel and Michelle Battista.
- FIC members Mark Failla, Marc Michalsky, Bob Murray, Brad Needleman, Laureen Smith and Dara Schuster served on the conference Planning Committee.
- FIC members Cheryl Achterberg, Ihuoma Eneli, Pat Gabbe, Carolyn Gunther, Marc Michalsky, Sharell Mikesell, Brad Needleman, Bob Murray, Dara Schuster, and Laureen Smith presented or facilitated sessions.
- See the program in Appendix H.



Keynote speaker David Kessler engages the audience

E. Launched two cross-cutting organizational initiatives: obesity and food security

Obesity and food security are current national priorities and urgent global needs. Consistent with Ohio State’s visionary food discovery theme, FIC identified leadership and invested in infrastructure to attack these problems. These are complex societal problems that a Center for Innovation is well positioned to address. These are multidimensional themes that require university-wide effort. Along with establishing the initiatives described below, food security and obesity were advanced with progressive support through these FIC activities:



Obesity Initiative

Leadership: Bob Murray and Michelle Battista

FIC investment: \$6,000 (June–Dec. 2011); \$50,000 (Jan.–Dec. 2012)

Key planned activities: Capitalizing on the momentum from the FIC annual meeting and the Obesity Symposium, this team initiated and oversaw the following: surveyed faculty expertise (phase 1 completed); formed an interactive network of three collaborating groups: early childhood obesity prevention, health portal, and obesity and inflammation (all are now meeting regularly to solidify research goals and plan for extramural support); established regular communications with obesity investigators (periodic e-news sent to

~100 and posted on the FIC website); developed a multidisciplinary seminar series centered on obesity prevention recommendations from the *2010 Dietary Guidelines for Americans* (first of five-part series has occurred).

Food Security Initiative

Leadership: Colleen Spees, leader (COM), Matt Kleinhenz (FAES), Mary Ellen Wewers (CPH), Diane Habash (COM), Michelle Kaiser (CSW), Steve Clinton (COM), external partners Matt Habash (Mid-Ohio Foodbank) and Bhuari Mohammed (Columbus Neighborhood Health Center)

FIC investment: \$50,000 (April 2012–April 2013)

Key planned activities: Coordinate and focus research and scholarship starting with local and state food security; pursue sustainable community-based collaborative research; provide core administrative support and targeted pilot funding; host OSU's first Food Security, Hunger, and Global Health Symposium in 2013; establish a food security and health graduate course; promote optimal health locally among the food insecure.

F. Collaborations beyond science, technology, engineering, and math (STEM)

Innovative solutions for many of the most vexing food problems require collaboration beyond STEM disciplines. FIC leadership set a goal of integrating business, arts & humanities, and social science scholars into our robust STEM activities.

Steps taken toward broad trans-disciplinary integration include:

1. Included a Target Awards track in our 2011 seed grant RFP to advance collaborations beyond STEM. Advertised the RFP campus wide. Two target awards were granted; one ended due to personnel changes at the Kirwan Institute. The 2012 seed grant RFP also urges involvement of faculty with expertise in business, social sciences, arts, and humanities.
2. Hosted Peter Klein, Director of the McQuinn Center for Entrepreneurial Leadership at the University of Missouri, to discuss with the directors strategies for fostering greater interactions between life and social scientists.
3. Articulated specific research questions that require solutions from scholars within and outside of STEM to shape an upcoming conference and RFA.
4. Identified primary and secondary data sources to address food research questions with organizational, policy, and network variables. These data can entice additional social scientists to engage in research about food issues.
5. Addition of new, engaged social science members. For example, [Charles Emory](#) brings his expertise in the behavioral and psychological aspects of weight management to an FIC obesity [team award](#); [L. Eugene Arnold](#), Professor Emeritus of Psychiatry, and [Stacey Moone](#), Clinical Research Assistant at the Nisonger Center, are mentoring a Metro high school student in a study of cholesterol's effects on autism through a match made by FIC; and clinical health psychologist [Lisa Christian](#) and developmental psychologist [Sarah Schoppe-Sullivan](#) are integral to a \$50,000 [Innovation Initiatives](#) childhood obesity team.
6. Subsidized registration costs for FIC faculty and associate members for two, two-day methods seminars on campus May 2012: *Survival Analysis* and *Longitudinal Data Analysis*. Courses were intended to refresh fundamental methodological skills.

Strategies for 2012–13 to foster new engagement of social scientists:

1. Announce a Social Science Data Grants RFA for obtaining or developing data to address questions about the economics and organizational systems of food industries.
2. Organize a conference at Ohio State to showcase work examining how business, contracting, economics, and sociology contribute to innovation in the food industry. The McQuinn Center, referenced above, will be a co-sponsor. A proposal will be submitted to NSF in an effort to generate additional sponsorship funds and visibility.
3. Organize and publish a catalog of food data sources.

V. Evidence of the success of the governance structure or adjustments made

Center governance engages four primary groups: the five co-directors plus staff, the eight External Board Members, the Faculty Review Committee, and the center membership.

- FIC directors and staff evaluate progress, plan future initiatives, and ensure effective investment of funds through monthly meetings, email and conversation. Mutual respect and good communication set the right course. Directors meet periodically with each of the groups below.
- The [External Advisory Board](#) involves eight respected private sector leaders:
 1. Chair: **Dan Wampler**, President, Synergy Flavors LLC, Cincinnati.
 2. **Dave Beck**, President and CEO, Center for Innovative Food Technology (CIFT)
 3. **Susan Finn**, President and CEO, American Council for Fitness & Nutrition
 4. **Matt Habash**, President and CEO, MidOhio Food Bank
 5. **Surinder Kumar**, President, Arora Innovations, Texas
 6. **Sudip Parikh**, VP of AgriFood and Vice President of Health Policy, Battelle.
 7. **Harold Schmitz**, Chief Science Officer, Mars, Inc.
 8. **Ken Smith**, Director of Food & Beverage Division (retired), Proctor & GambleThe board has face-to-face meetings in conjunction with the annual meeting. The board advises FIC on sustainability and the expansion of cross-disciplinary research. Chair Dan Wampler meets periodically with center leadership, and we anticipate more in-depth discussion throughout 2012.
- The [Faculty Proposal Review Committee](#) provides peer review of internal grants. Eleven faculty members serve representing eight colleges. The committee provides continuity, supports the center's mission, and ensures objectivity in reviews. This volunteer activity has minimal compensation, and a major success was the review of the \$50,000 Innovation Initiatives. We thank these review team members: **Prosper Boyaka**, Vet Med; **Brian Focht**, EHE; **Daren Knoell**, Pharmacy; **Kichoon Lee**, FAES; **Gregory Lesinski**, COM; **Sharell Mikesell**, Office of Research; **Thelma Patrick**, Nursing; **Christopher Taylor**, COM; **Christopher Weghorst**, CPH; **Ahmed Yousef**, FAES; **Ouliana Ziouzenkova**, EHC.
- The FIC center membership includes 160 faculty members, 43 staff and 47 graduate students. Center leadership is distributed at five campus locations giving good proximate access to members, which also makes leadership diffuse. Center members fully subscribe to the food discovery theme.

VI. Evidence that goals and objectives are achieved--direct results

A. Peer-reviewed publications directly resulting from the Food Innovation Center

Program	Published	In Press	Submitted	Total
	Total to date (number of total with student authorship)			
2010 seed grants	9 (7)	1 (1)	2 (2)	12 (10)
2011 seed grants	1 (1)	1 (1)	2 (2)	4 (4)
Totals	10 (8)	2 (2)	4 (4)	16 (14)

Full citations are in Appendix I.

B. Professional presentations directly resulting from FIC

Program	Presented	Accepted	Submitted	Total
	Total to date (number of total presented by a student)			
2010 seed grants	38 (15)	1 (1)	--	39 (16)
2011 seed grants	1 (1)	2 (1)	1 (1)	4 (3)
2012 team awards	--	--	2	2
Totals	39 (16)	3 (2)	3 (1)	45 (19)

Full citations are in Appendix J.

C. Honors and awards a direct result of FIC

Eleven honors and awards, including nine to students, have flowed from FIC-sponsored research, as seen in Appendix K. Examples include Pelotonia fellowships and local and national awards.



D. Graduate student and undergraduate student notable accomplishments

Students have 14 publications and 19 presentations as a direct result of FIC-sponsored research (above tables). Student designations are in Appendices I–K.

E. Additional funding via OSP or development or outreach and engagement

Teams directly supported by FIC either by funding or proposal leadership have to date total **requests of \$51,090,137** extramurally and have won **awards of \$7,590,703**.

Funded				
Origin	FIC Team	Title	Sponsor	Award
FIC direct support	K Lee, S Myers, S Sastry, A Yousef	Commercial Development and Deployment of Innovative Ohio Sanitation Technology	Ohio Third Frontier	\$2,998,532
FIC conduit	J Geisler, M Hyché, D McDulin, S Myers, K Lee	Microwave Assisted Thermal Sterilization	Ohio Third Frontier	\$1,700,000*
2010 seed	R Linton, J Li, L Saif & Q Wang at OSU + 20 outside	Building Capacity To Control Viral Foodborne Disease Using A Translational, Multidisciplinary Approach	USDA NIFA sub NC State	\$1,300,000 @ OSU / \$25M
2010 seed	H Chen, J Li, J Jiang, K Lee, C Wu, Y Su, et al	Inactivation of enteric foodborne viruses by non-thermal processing technologies	USDA NIFA sub U of DE	\$1,149,994 @ OSU / \$5M
2010 seed	J Li, L Jaykus, K Lee, D Doohan, H Chen, J Jiang, R Uribe	An integrated approach to prevent and minimize foodborne enteric viruses in vegetables and fruits	USDA NIFA	\$1,000,000
2011 seed	G Kaletunc, M Giusti, D Hansford, M Failla	Stability and targeted delivery of microencapsulated anthocyanins for improved food quality and health	USDA NIFA	\$499,954

2010 seed	J Tiniano, KB Jones, P Grewal, M Rabe, M Wagenbrenner	An agrarian urbanist overlay for central city development	US HUD sub MORPC	\$329,440 @ OSU / \$0.86M
FIC conduit	Y Vodovotz, M Kleinhenz, K Lee, S Schwartz	An industry-university partnership for innovative malnutrition solutions in Haiti	Abbott	\$213,383
FIC conduit	M Failla, C Chitchumroonchokchai	Stability, uptake and transport of CoQ10 and Kaneka QH using Caco-2 human intestinal cells	Kaneka Nutrients L.P.	\$54,400
2010 seed	G Lesinski, Y Vodovotz	The effects of soy almond bread on the immune system of prostate cancer patients	Ohio Soy Council	\$45,000
*Direct award to Wornick Cincinnati, not in OSU total below				-\$1,700,000
Total Funded Extramural Awards to date =				\$7,590,703

Submitted, pending review

Origin	FIC Team	Title	Sponsor	Pending
2010 incentive	P Grewal & 17 et. al. at OSU	A Center of Innovation for Sustainable Development	USAID Higher Ed	\$9,845,100
2011 team	C Hoy, M Hogan, R MacDonald, M Partridge	Social, business, and ecological networks for local economies and increased food security	USDA NIFA	\$4,660,999
2010 seed	G Lesinski, S Clinton, Y Vodovotz	Modulation of antitumor immunity by dietary soy and its constituents	NIH R01 to NCI-CDP	\$1,906,250
2011 seed	Ouliana Ziouzenkova	Integrating vitamin A metabolism in regulation of obesity-induced atherosclerosis in females	Am Heart Association GIA	\$153,999
2011 seed	R Murray, M Battista-Hesse, C Achterberg, P Gabbe, J Goodway, C Gunther, J McDowell, T Patrick	Addressing critical nutrition needs from pregnancy through early childhood in a disadvantaged urban neighborhood	Allen Foundation	\$85,000
FIC conduit	M Failla, C Chitchumroonchokchai	Bioavailability of Coenzyme Q	Kaneka Nutrients L.P.	\$75,022
Total Pending Requests to date =				\$16,726,370

Not funded

Origin	FIC Team	Title	Sponsor	Not Funded
2010 seed	P Grewal, M Kleinhenz, P Ling, M Batte, C Hoy, D Doohan	Specialty crops enterprises for enhanced urban self-reliance and resilience	USDA Special Crops	\$9,580,050
2010 seed	P Grewal, M Kleinhenz, P Ling, J Sharp, J Parker, M Bean, et al	From disadvantaged to vibrant and self-reliant: localizing food systems as a cornerstone strategy	USDA AFRI	\$4,793,953
2010 seed	M Belury, C Achterberg, M L Eastridge, J Goodway, C Gunther	Comprehensive, sustainable approach to obesity prevention for preschoolers in underserved communities	USDA NIFA	\$4,647,413
2010 seed	P Grewal, LP Phelan, M Gardiner, N Basta, R Islam, T W Blaine et al	Using ecological design to mitigate contaminant and pesticide risks of urban agriculture	USDA NIFA	\$2,492,517
2010 seed	P Boyaka, M K Chan, O Ziouzenkova; E Cormet-Boyaka	Enhancing mucosal immune responses with protein particles	NIH R01	\$1,906,250
2010 seed	P Boyaka, M K Chan, E Cormet-Boyaka, O Ziouzenkova	Regulation of NALT-Based Immunity by protein particles	NIH U01	\$1,858,927
2010 seed	O Ziouzenkova	Crosstalk of estrogen and vitamin A metabolites in regulation of visceral obesity in females	NIH R21	\$419,375
2010 seed	O Ziouzenkova	The role of vitamin A metabolism in the regulation of immunoglobulin production in B cells	NIH R21	\$407,114
FIC cost share	P Grewal, G, Singh, SS Bosu, and 12 OSU investigators	Fostering economic development and resilience through local self-reliance	Obama-Singh	\$249,965
2010 seed	G Lesinski, S Clinton, Y Vodovotz	The effect of controlled dietary soy intake on immune function in prostate cancer	NIH R03	\$152,500
2011 seed	O Ziouzenkova and ST Yang	3D multi-biosensor scaffolds for identification of poly-functional nutrients	Gates Foundation	\$100,000
2011 seed	O Ziouzenkova and ST Yang	Geonutrition for healthy children: optimization with	Gates	\$100,000

seed		3D multisensors	Foundation	
2011 seed	C Gunther, J Kennel, J Goodway	Simple Suppers: A novel approach to childhood obesity prevention	General Mills Foundation	\$35,000
2011 seed	O Ziouzenkova and ST Yang	Identification of beneficial egg properties in high-throughput multifunctional assays	US Poultry & Egg	\$30,000
Total Unfunded Requests to date =				\$26,773,064
Total of all requested extramural competitions =				\$51,090,137
Total all awarded extramural support =				\$7,590,703

F. Invention disclosures, patents or other evidence of commercialization

FIC supported teams seek commercialization:

- A **\$2.99 million Third Frontier award** to Ken Lee (PI), Stephen Myers, Sudhir Sastry, Ahmed Yousef flows from an FIC 2010 Innovation Initiative award and proposal development support by FIC. It is a significant commercialization milestone, linking Ohio State with the Three Family Farms (aka Egg Tech Ltd., Ohio egg producers) and Xigent (Lewis Center, Ohio manufacturer) accelerating market entry of an OSU-patent that makes whole shell eggs safe. This project creates jobs and economic growth in Ohio, royalties for Ohio State, and funds for R&D on innovative applications of an all-Ohio technology.
- A \$1.7 million Third Frontier award to Wornick Foods (Cincinnati, OH) flows from partnership with OBIC and names FIC's Ken Lee as the collaborator. It establishes a national center for Microwave Assisted Thermal Sterilization. Wornick collaborates with Ohio State FIC, the Center for Innovative Food Technology of Toledo, AmPac Packaging, and Nestle. The company plans a \$10 million investment to create the R & D Center where consumer products companies can test the process. <http://tinyurl.com/cnxp2ox>
- V.M. Balasubramaniam's 2010 seed grant led to the filing of an invention disclosure. The team is now working with TCO on a **patent application**.
- Mark Failla's 2010 seed grant team is in ongoing conversations with Erin Bender, TCO, and consultant Brandon Lloyd.
- Yael Vodovotz's 2010 seed grant provided preliminary results in support of a **confidential disclosure agreement**.
- Ouliana Ziouzenkova's 2011 seed grant led to the formation of the **startup company** LifeCapsules, LLC, and a Small Business Innovation Research (SBIR) **SHIFT proposal** "Microencapsulation of bioengineered cells for visceral obesity treatment" (\$132,000 sub-award to Ohio State, pending) based on a patented OSU invention.
- Chris Taylor's 2011 team is planning an NIH SBIR submission in August 2012 with Viocare, Inc. (Princeton, NJ) to test the use of technology to improve dietary assessment and facilitate behavior change in at-risk adults.

FIC has substantial indirect activities to report. We could list the total output of FIC members from database searches. Although this list is quite impressive, indirect results of center funding have questionable value. We choose to focus on documented center results in this report. We respectfully do not list substantial numbers of indirect accomplishments as they are subjective.

VII. Personnel changes and how they have been addressed

In March 2012, FIC posted a job description for a new full-time **Grants & Contracts Specialist**. This staff member will support proposal development and enhance the competitiveness of complex interdisciplinary proposals that advance FIC priorities including sustainability. We completed interviews and anticipate filling the position in June 2012. We have adjusted our budget allocations to support this need of our membership.

On July 1, 2012, Program Manager Alex Barkley plans to join the International Poverty Solutions Collaborative full time, vacating his 50:50 split support of the two innovation centers. This position remains mission-critical and a revised posting will include new communications tasks plus prior responsibilities. We plan to fill it July 1. We adjust our budget to cover 50% of this priority but welcome central funding if possible.

VIII. Data for your adopted metrics to gauge the success of the CI

Metrics	Y1 achievements (2010–11)	Y2 achievements (2011–12)
Dollars invested in multidisciplinary grants	\$262,000 2010 Seed Grants \$30,000 Innovation Incentives \$292,000 Total	\$224,808 2011 Seed Grants \$22,006 2011 Team Awards \$194,461 2012 Innovation Initiatives \$441,275 Total
Number of special topic initiatives	Not reported	<i>Identified leaders and invested in programmatic infrastructure: Obesity</i> Bob Murray and Michelle Battista <i>Food security</i> Colleen Spees & cross-college team
Number of new cross-disciplinary collaborations	13 cross-disciplinary collaborations through funding programs	22 collaborations supported through funding programs
Number of sustained cross-disciplinary collaborations	To be assessed as the center matures	All 13 of the teams funded in year one continue to collaborate
Number of extramural grants applied for by cross-college teams	Seed grant teams have submitted 13 proposals to date	16 proposals submitted
Number of successfully funded extramural grants	FIC grant teams have secured seven extramural grants	Four extramural grants
Number of partnerships with external organizations	<ul style="list-style-type: none"> Cultivated relationships with 14 external organizations. Outcomes have included funded and pending proposals. 	<ul style="list-style-type: none"> 15 new and ongoing relationships with external organizations. Outcomes include funding and publicity, such as Appendix L.

Metrics	Y1 achievements (2010–11)	Y2 achievements (2011–12)
Amount of money raised or leveraged	<ul style="list-style-type: none"> Created a \$10k matching fund for leverage by FIC members. Met with potential stakeholders, several deans, and VPs. 	<ul style="list-style-type: none"> \$19,000 committed in cost share if member proposals are funded. \$432,473 in extramural funding directly to FIC as shown in IX.
Number of scholarly publications	Seed grant teams have seven publications in the review pipeline, with more planned.	Teams have submitted ten new publications; ten published to date across years.
Number of scholarly presentations	18 presentations submitted or delivered at national and local meetings by funded teams.	27 new presentations submitted, accepted, or delivered by funded teams.
Number of commercialization endeavors	Not reported	<ul style="list-style-type: none"> Two successful Third Frontier awards: \$3 million for egg safety and \$1.7 million with Wornick. Confidential discussion of campus food manufacturing facility. Presentation by Brian Cummings and an industry partnerships breakout at the annual meeting. Funded team outputs in V.I.F.
Number of students participating in FIC events, seminars, and courses	<ul style="list-style-type: none"> First year educational efforts established partnerships. Most educational activities were delayed to focus on infrastructure and grant programs in year one. 	<ul style="list-style-type: none"> 30 trainees received subsidized registration for the obesity symposium and participated in the obesity workshop with industry. 12 students at the annual meeting. 11 trainees in the obesity post-conference grant writing workshop. Six Mount Scholars in Leadership Month presentation by Mark Failla and Carolee Barber.
Funds invested in student learning and professional experience	\$3,365 supported the annual Russell Klein Research Symposium and speakers for existing seminar series.	\$17,400 supported student travel awards, high school mentorship supplies, trainee subsidies for obesity symposium registration, and seminar and special event co-sponsorships.
A written plan for organizational infrastructure	The center's logic model enabled an evolving plan for sustainability.	Prior logic model has evolved into a draft sustainability plan, pending Board review.