

**V(A). Planned Program (Summary)**

**Program # 12**

**1. Name of the Planned Program**

Human Health (OARDC Led)

Reporting on this Program

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
502	New and Improved Food Products	0%		5%	
703	Nutrition Education and Behavior	0%		5%	
721	Insects and Other Pests Affecting Humans	0%		20%	
722	Zoonotic Diseases and Parasites Affecting Humans	0%		50%	
723	Hazards to Human Health and Safety	0%		10%	
724	Healthy Lifestyle	0%		10%	
	<b>Total</b>	0%		100%	

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	1.4	0.0
<b>Actual Paid</b>	0.0	0.0	1.3	0.0
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

**2. Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	156776	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	250395	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

### V(D). Planned Program (Activity)

#### 1. Brief description of the Activity

On-going research activities to advance human health goals for societal well-being include both basic and applied research, as discussed in previous sections for this Planned Program. Effective research requires a mixture of laboratory and gathering places for subjects to maximize research knowledge. Emerging threats now require more advanced facilities such as a bio-security lab, particularly needed in the study infectious animal diseases that may directly impact humans. All functional laboratories and sites are improved over time as program need warrants. OARDC faculty and staff will engage in appropriate levels of outreach, engagement, and consultation with both internal stakeholders such as fellow Extension personnel, and with external stakeholders.

#### 2. Brief description of the target audience

Targeted audiences include, but are not limited to:

- Specific individuals or groups who have expressed a need for health, obesity, and safety information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature;
- Fellow academic units that depend on scientists in this program for support information and for new health and safety technologies and approaches/measures fellow agencies or support organizations who will not only use the information but will also extend that information; populations who have not requested the information but will likely benefit from that information;
- Other scientists and scientific groups;
- Health workers/organizations;
- Political entities;
- Extension personnel;
- Students from pre-school to post doctorate studies;
- News organizations;
- Business and industrial groups.

#### 3. How was eXtension used?

eXtension was not used in this program

### V(E). Planned Program (Outputs)

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	0	0	0	0

**2. Number of Patent Applications Submitted (Standard Research Output)**  
**Patent Applications Submitted**

Year: 2014  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	0	7	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of graduate students completed  
 Not reporting on this Output for this Annual Report

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Release studies on insects, ticks, and mites to protect human health that will provide a set of alternatives leading to health gains with lowered risks, and within economic realities, for the affected populations.
2	Advance the understanding of means and methods related to transmission of zoonotic diseases to humans, including prevention, that meets consumer demand/health threat, as or before such emerges.
3	Reduce through research, development, and outreach the exposure to biohazards, pathogens, and similar to the extent that annually such are reduced per capita with an overall time and economic savings to those who may be affected.
4	Reduce health risk by releasing at least one major study each five years demonstrating techniques, procedures, or products that lessen the chance of contacting, or the impact if contacted, zoonotic diseases.
5	Create a growing base of knowledge that supports improving human health as it relates to food, environment, and lifestyle
6	Expand utilization of products with known functionality or nutraceutical value and give consumers greater informed choices, including the bioavailability of the desired substance in the food, than they presently have.

### **Outcome #1**

#### **1. Outcome Measures**

Release studies on insects, ticks, and mites to protect human health that will provide a set of alternatives leading to health gains with lowered risks, and within economic realities, for the affected populations.

Not Reporting on this Outcome Measure

### **Outcome #2**

#### **1. Outcome Measures**

Advance the understanding of means and methods related to transmission of zoonotic diseases to humans, including prevention, that meets consumer demand/health threat, as or before such emerges.

Not Reporting on this Outcome Measure

### **Outcome #3**

#### **1. Outcome Measures**

Reduce through research, development, and outreach the exposure to biohazards, pathogens, and similar to the extent that annually such are reduced per capita with an overall time and economic savings to those who may be affected.

Not Reporting on this Outcome Measure

### **Outcome #4**

#### **1. Outcome Measures**

Reduce health risk by releasing at least one major study each five years demonstrating techniques, procedures, or products that lessen the chance of contacting, or the impact if contacted, zoonotic diseases.

Not Reporting on this Outcome Measure

### **Outcome #5**

#### **1. Outcome Measures**

Create a growing base of knowledge that supports improving human health as it relates to food, environment, and lifestyle

Not Reporting on this Outcome Measure

## **Outcome #6**

### **1. Outcome Measures**

Expand utilization of products with known functionality or nutraceutical value and give consumers greater informed choices, including the bioavailability of the desired substance in the food, than they presently have.

### **2. Associated Institution Types**

- 1862 Research

### **3a. Outcome Type:**

Change in Condition Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	0

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

The relationship between diet and health is a highly complex one, and it is the focus of Ohio State University's Center for Advanced Functional Foods Research and Entrepreneurship (CAFFRE). CAFFRE is part of the College of Food, Agricultural, and Environmental Sciences and involves faculty members from eight other colleges and schools across campus, including the College of Medicine and The Ohio State University Comprehensive Cancer Center -- Arthur G. James Cancer Hospital and Richard J. Solove Research Institute.

#### **What has been done**

OARDC food scientists are focusing on creating new functional foods that potentially could prevent and treat chronic disease without demanding that consumers make major changes to their diets.

The scientists have been working with a large multidisciplinary team for several years to study the anti-cancer properties of confections and nectar made from freeze-dried black raspberries. The products have a high concentration of polyphenols, a type of antioxidant found naturally in black raspberries. The antioxidant and anti-inflammatory properties may halt tumor growth; however, the berries are seasonal and can be hard to find in stores, so, a berry candy could make the antioxidants more easily available year-round.

Scientists freeze-dried and ground black raspberries into a powder to help preserve the cancer-fighting nutrients, then made gummy candies and a concentrated juice drink, each equal to about a cup of fresh berries.

Currently, the team is analyzing results of a clinical trial of prostate cancer patients. During the three to four weeks while the participants awaited surgery, they consumed differing amounts of the confections or the nectar. Researchers are studying whether the compounds from the solid confection or the liquid nectar are better absorbed, and they're also studying other aspects of the participants' diets -- coffee, tea and chocolate consumption -- to determine if antioxidant compounds in those foods affected the black raspberry absorption.

### **Results**

The team hopes to find which diet is best, which dosage is best, and which form of delivery (nectar or confection) is best -- that is, which method of introducing the compounds into the body has a stronger benefit.

For now, the confections are being tested in healthy individuals to see how the metabolites are being absorbed in the mouth.

New research strongly suggests that a mix of preventative agents, such as those found in concentrated black raspberries, might more effectively inhibit cancer development than single agents aimed at shutting down a particular gene.

Researchers hope to have the candies and concentrated juice available to consumers within the year.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
502	New and Improved Food Products

## **V(H). Planned Program (External Factors)**

### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

### **Brief Explanation**

Multiple factors, including factors such as climate change and weather conditions, play a major role in encouraging the growth and spread of pests and diseases that can be transmitted to humans. Shifts in economy can impact the government's ability to address human health matters. Access to health care, both real and due to political positions, and education regarding healthy lifestyles also affects outcomes. Within this program area public monies, and the fluctuations in appropriations of such, have dramatic affect on human health, as do levels of regulations. Likewise public policy and the public's priorities

and perceptions, especially regarding risks, are major external factors impacting this program.

Priority of this research for limited dollars and the resulting competition impact the extent of research that can be carried out. Items such as potential levels of public exposure to certain zoonotic diseases are major external factors. Likewise public willingness to learn safety procedures in terms of pests or zoonotic disease threats are factors impacting research outcomes. Willingness to pay by consumers for additional food safety is also an external factor. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, and programmatic demands that exceed available resources are affecting outcomes.

## **V(I). Planned Program (Evaluation Studies)**

### **Evaluation Results**

For 2014, CFAES-OARDC has conducted no formal studies regarding evaluation of our research program. Surrogate evaluation metrics--inclusive but not limited to--that are considered indicators of research success are:

- Research contracts and awards received/ongoing/completed (\$166 million plus in active projects during 2014);
- Number of referred publications reported elsewhere in this report;
- Number of business, industries and groups engaged in CFAES's research programs;
- Number of patents received;
- Economic impact of this college's research program as reported elsewhere in this report;
- The level of base funding from USDA-NIFA and the State of Ohio in 2014;
- Impacts submitted in this report, and the continued robustness of CFAES' research program throughout 2014, both in terms of breadth of programs and depth of new knowledge generated and applied.

The research reported herein is also supported by an informal yet effective formative evaluation. Very little research is conducted at OARDC without early engagement of business, industry, commodity groups, special interest or community groups, or other interested parties given these are the individuals who have the need for and will be the adopters of our research output/impacts. Even in the case of very theoretical research, fellow researchers in industry, government, and academic institutions are consulted (formative evaluation/needs assessment) in the formulation of studies.

### **Key Items of Evaluation**

OARDC's research on black raspberries suggests that a mix of preventative agents, such as those found in concentrated black raspberries, may more effectively inhibit cancer development than single agents aimed at shutting down a particular gene.