

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

**Program # 7**

**1. Name of the Planned Program**

Childhood Obesity

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
701	Nutrient Composition of Food			15%	
702	Requirements and Function of Nutrients and Other Food Components			50%	
703	Nutrition Education and Behavior			25%	
723	Hazards to Human Health and Safety			10%	
	<b>Total</b>			100%	

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

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

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	5.6	0.0
Actual Paid Professional	0.0	0.0	6.2	0.0
Actual Volunteer	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	35026	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	146914	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	572569	0

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

**1. Brief description of the Activity**

- Conduct research experiments
- Partner with the Extension and other MSU colleges to develop recipes using new grain products
- Publish findings of research involving diseases that might be impacted by nutrition
- Conduct experiments and analyze, evaluate data for studies within the genetic, metabolic and systemic physiological processes that underline Fatty Liver Disease

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

- Specific health based consumer groups
- Domestic and foreign buyers of quality grains
- Farmers, colleagues, and stakeholders
- Grain associations, Montana Department of Agriculture, Montana Wheat and Barley Committee, grain elevators, and state commodity groups
  - Economic development groups
  - Participants in extension and commodity group meetings, conventions, and conferences, and field days
  - State of Montana, Montana Department of Agriculture, BLM, USFS, and other government entities

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
Actual	0	6	0

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

## **Output Target**

### **Output #1**

#### **Output Measure**

- There are no planned activities in this area. The work on childhood obesity was primarily conducted by the MSU College of Education, Health, and Human Development whom do not have MAES support.  
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	New crops identified with options for specific health-need based consumers
2	Relationship between high fat diet and liver-cell turnover

## **Outcome #1**

### **1. Outcome Measures**

New crops identified with options for specific health-need based consumers

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

- 1862 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	0

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

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

Consumers are increasingly demanding specific health-based markets, and the development of new grains for production. Nutritional needs and activity from the gluten free community and celiac sufferers is leading to increased sales in health markets, in turn, this creates an increased demand in acreage for the development of new grains. Ultimately, the goal is to expand the number of value-added crops.

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

Development of camelina, timtana, proatina and montina, was continued and the process of expanding their marketability and profitability to growers was investigated. Research involving a consumer base with needs that are not being met by current crops is also ongoing.

#### **Results**

New germplasm in potatoes and oats were screened for better nutritional traits. Several low glycemic lines are in the advanced stages of testing for nutritional and agronomic tests. A new germplasm was created, which and several new low glycemic lines of potato and one low glycemic line of naked oats and one low glucosinolate Camelina sativa line for microgreens.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
701	Nutrient Composition of Food
703	Nutrition Education and Behavior

## **Outcome #2**

### **1. Outcome Measures**

Relationship between high fat diet and liver-cell turnover

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

- 1862 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	0

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

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

Tens of millions of Americans suffer from fatty liver disease (FLD) and an estimated eight-million of these people will progress to liver cirrhosis. Most cases of FLD are caused by excessive consumption of either calories or alcohol, so the attempts at treatment of this disease are solely behavioral. The enormous prevalence of FLD indicates that behavioral approaches are not adequately effective. Because of such, a deeper understanding of the genetic, metabolic and systemic physiological processes that underline FLD provide a better understanding of genetic predispositions to the disease. Examining the nation's food supply or reviewing USDA's nutritional recommendations may also be effective in reducing national rates of FLD.

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

Using a set of three novel mouse models that have been developed within the project, each model has been manipulated to host genetic predispositions to FLD. The models allow the opportunity to distinguish the metabolic pathways underlying FLD, and allow assessment in the dietary/supplement/food-quality evaluations. The evaluation of genetic susceptibility to environmental FLD on the effects of dietary fat on animals (mouse models), have provided a deeper understanding of the relationship between some forms of genetic or metabolic susceptibility to FLD.

#### **Results**

Several novel mouse models have been developed and two papers have been published regarding work with the models. One of these mouse models has been accepted for public distribution by Jackson Laboratories as stock #023035. Several educational aids have been produced and several activities and experiments have been conducted in analyzing data for general mouse studies with FLD. The mouse models have been incorporated into two senior-level courses on functional genomics, the PI was invited as a keynote speaker and presenter on Redox Biology at the University of Nebraska, Lincoln.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components

#### 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 Programmatic Challenges

##### Brief Explanation

There were no planned activities in this area. The work on childhood obesity was primarily conducted by the MSU College of Education, Health, and Human Development whom do not have MAES support.

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

##### Evaluation Results

There were no planned activities in this area. The work on childhood obesity was primarily conducted by the MSU College of Education, Health, and Human Development whom do not have MAES support.

##### Key Items of Evaluation

There were no planned activities in this area. The work on childhood obesity was primarily conducted by the MSU College of Education, Health, and Human Development whom do not have MAES support.