V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Childhood Obesity-Youth/Adult Obesity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
<th>%1862 Extension</th>
<th>%1890 Extension</th>
<th>%1862 Research</th>
<th>%1890 Research</th>
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<td>701</td>
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<tr>
<td>702</td>
<td>Requirements and Function of Nutrients and Other Food Components</td>
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<td>10%</td>
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<tr>
<td>703</td>
<td>Nutrition Education and Behavior</td>
<td>25%</td>
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<tr>
<td>704</td>
<td>Nutrition and Hunger in the Population</td>
<td>15%</td>
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<td>724</td>
<td>Healthy Lifestyle</td>
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V(C). Planned Program (Inputs)

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

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<th>Extension</th>
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2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

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<tr>
<th></th>
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<th>Research</th>
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<tr>
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V(D). Planned Program (Activity)

1. Brief description of the Activity

- To identify the factors that promote excessive weight gain as well as protect against childhood obesity.
- Measure how children born small for age are different with respect to body composition and risk for diabetes prior to developing diabetes or obesity.
- Investigate how perilipin A works in adipocytes to control fat storage and fat breakdown.
- Collect and analyze data on obesity-related measures (i.e., BMI) in adults and children.
- Examine how weight loss affects calcium absorption and bone mass.
- Create a multidisciplinary program comprising of faculty, staff, the medical community, industry partners and government officials.
- Conduct adult/youth education and deliver targeted messages on healthy food choices and increased physical activity education using the following strategies:
Direct Methods:
• Educate Youth
• Educate Parents
• Educate Volunteers
• Food and Fitness Ambassadors
• Educate Professionals
  - Child Health Summit
• Educate Teachers/School Nurses
• Educate Communities

Indirect Methods:
• Website

2. Brief description of the target audience

• Clinicians and Physicians Nurses School
• Health Care Professionals
• Hospitals (including teaching hospitals)
• Staff and students who gain valuable scientific experience
• Industry partners that benefit from fundamental and applied research in obesity and related chronic diseases
• Communities that benefit from increased knowledge about the mechanisms involved in obesity
• Other faculty and staff working on similar research
• Health-related organizations and foundations interested in obesity/nutrition issues
• School Age Youth
• Teens
• Teachers
• After School Providers
• Parents
• Volunteers
• Extension Professionals
• State and County Agencies and Organizations

V(E). Planned Program (Outputs)

1. Standard output measures

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<th>Direct Contacts Adults</th>
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<th>Direct Contacts Youth</th>
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</table>

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

Patent Applications Submitted

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

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<tr>
<th>2009</th>
<th>Extension</th>
<th>Research</th>
<th>Total</th>
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<tr>
<td>Actual</td>
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<td>11</td>
<td>17</td>
</tr>
</tbody>
</table>
Output Target

Output #1

Output Measure

● A variety of strategies will be implemented to reach target audiences. This will include and not be limited to workshops, field visits, classes, newsletters, media releases, electronic communications, publications. In addition a trained volunteer teaching base will be developed. Quantitative reports of participation will be collected.

Not reporting on this Output for this Annual Report
### V(G). State Defined Outcomes

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

<table>
<thead>
<tr>
<th>O. No.</th>
<th>OUTCOME NAME</th>
</tr>
</thead>
</table>
| 1      | Short Term  
Individuals gain awareness, knowledge, skills related to:  
- Attitudes about healthy eating for adults/youth  
- Healthy food choices for adults/youth  
- Selection of healthy foods for adults/youth  
- Benefits of physical activity (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer)  
- Physical activity recommendations for health for adults/youth  
- Identify factors that promote excessive weight gain as protect against childhood obesity  
- Understand the molecular mechanisms of lipid transport in the intestinal cell  
- Demonstrate the affects on calcium absorption and bone mass by weight loss |
| 2      | Medium Term  
Individuals incorporate skills/Change behaviors related to:  
- Increased adoption of healthy food practices  
- Increased consumption of fruits, vegetables, whole grains and low-fat dairy  
- Increased participation in family meals  
- Increased participation in physical activity  
- Increased participation in family-related physical activity  
- Increased use of new "campaign" website  
- Improved understanding of the relationship between early nutrition and later risk for chronic disease  
- Understand the process by which perilipins at the surface of lipid droplets control how much energy is released from the adipocyte at times of need  
- Understanding how the intestines and body uptake and process dairy fat  
- Identify genes, their protein product and how the proteins influence the way the body processes fat. |
| 3      | Long Term  
Individuals experience:  
- Decreased overweight and obesity for youth/adults  
- Decreased risk factors for nutrition-related health problems and chronic diseases that are affected by diet and physical activity for youth/adults  
- A clear and comprehensive understanding of the genetic and physiological mechanisms of obesity and related chronic diseases  
- Pharmacological and/or medical treatments to alleviate the effects of obesity and related diseases |
| 4      | Genetics, Taste Perception and Obesity-Medium Term  
Individuals incorporate skills/Change behaviors related to:  
- Increased adoption of healthy food practices  
- Increased consumption of fruits, vegetables, whole grains and low-fat dairy  
- Increased participation in family meals  
- Increased participation in physical activity  
- Increased participation in family-related physical activity  
- Increased use of new "campaign" website  
- Improved understanding of the relationship between early nutrition and later risk for chronic disease  
- Understand the process by which perilipins at the surface of lipid droplets control how much energy is released from the adipocyte at times of need  
- Understanding how the intestines and body uptake and process dairy fat  
- Identify genes, their protein product and how the proteins influence the way the body processes fat. |
| 5      | Promoting Healthy Eating to Prevent Excessive Weight Gain in Young Adults-Medium Term  
Individuals incorporate skills/Change behaviors related to:  
- Increased adoption of healthy food practices  
- Increased consumption of fruits, vegetables, whole grains and low-fat dairy  
- Increased participation in family meals  
- Increased participation in physical activity  
- Increased participation in family-related physical activity  
- Increased use of new "campaign" website  
- Improved understanding of the relationship between early nutrition and later risk for chronic disease  
- Understand the process by which perilipins at the surface of lipid droplets control how much energy is released from the adipocyte at times of need  
- Understanding how the intestines and body uptake and process dairy fat  
- Identify genes, their protein product and how the proteins influence the way the body processes fat. |

Report Date 06/23/2010  
Page 4 of 10
Outcome #1

1. Outcome Measures

Short Term Individuals gain awareness, knowledge, skills related to: Attitudes about healthy eating for adults/youth Healthy food choices for adults/youth Selection of healthy foods for adults/youth Benefits of physical activity (reduced overweight and obesity, reduced risk of diabetes, heart disease and cancer) Physical activity recommendations for health for adults/youth Identify factors that promote excessive weight gain as protect against childhood obesity Understand the molecular mechanisms of lipid transport in the intestinal cell Demonstrate the affects on calcium absorption and bone mass by weight loss

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Medium Term Individuals incorporate skills/Change behaviors related to: Increased adoption of healthy food practices Increased consumption of fruits, vegetables, whole grains and low-fat dairy Increased participation in family meals Increased participation in physical activity Increased participation in family-related physical activity Increased use of new “campaign” website Improved understanding of the relationship between early nutrition and later risk for chronic disease Understand the process by which perilipins at the surface of lipid droplets control how much energy is released from the adipocyte at times of need Understanding how the intestines and body uptake and process dairy fat Identify genes, their protein product and how the proteins influence the way the body processes fat.

2. Associated Institution Types

● 1862 Extension
● 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantitative Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
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<td>0</td>
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</table>

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Obesity/Nutrition and Other Health-Related Research

Obesity has reached epidemic proportions in the United States, and is associated with rising levels of diabetes, heart disease, and other chronic health conditions among U.S. residents. Increased incidence of these health conditions leads to rising health care costs and declining quality of life for those affected.

What has been done
NJAES researchers have made contributions in a range of relevant areas, from basic research into the biochemical mechanics that lead to or exacerbate a tendency towards obesity to interventions to address this national priority area and its sequelae. Research into the molecular mechanisms of lipid transport in the intestinal cell, in order to enable the regulation of dietary lipid assimilation, yield findings that demonstrate key structural elements involved in fatty acid transport by lipid-binding proteins, and the effects of structural changes on transport function. Our cell-based and animal-based studies demonstrate clearly that lipid assimilation in the intestinal cell is controlled differently depending on whether the lipid is delivered to the cell via the diet or via the bloodstream. These studies are leading to an understanding of the basic mechanisms by which we absorb and utilize lipid, and thus may lead to rational strategies to modulate this important process. Further, NJAES researchers are also seeing that specific lipid metabolites, in particular monoacylglycerol, may play a functional role not only in lipid synthesis, but also in the regulation of appetite and energy expenditure. These studies have important implications for the nutritional and
pharmacologic treatment of disorders ranging from obesity and its metabolic sequelae, to malabsorption. The importance of intestinal lipid metabolites in the regulation of appetite is also potentially useful as a tool for controlling food intake.

**Results**

Other research findings provide the first evidence of the absolute need of macrophages (white blood cells within tissues) for glutamine. The findings indicate that the high number of macrophages that infiltrate adipose tissue (body fat) during obesity, and which are believed to contribute to the development of insulin resistance, would require glutamine in very large amounts. A further finding of very low expression of glutamine synthetase in such cells, together with the very low rate of blood flow through adipose tissue, indicate that glutamine synthesis by adipocytes may play an important role in maintaining macrophages, and thus the development of insulin resistance, during obesity. Modification of adipose tissue glutamine metabolism in vivo may offer a means to prevent, or minimize, the detrimental effects of macrophages-based inflammation in adipose tissue and thus prevent obesity-linked insulin resistance and the development of Type 2 diabetes mellitus.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>701</td>
<td>Nutrient Composition of Food</td>
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<tr>
<td>702</td>
<td>Requirements and Function of Nutrients and Other Food Components</td>
</tr>
<tr>
<td>703</td>
<td>Nutrition Education and Behavior</td>
</tr>
<tr>
<td>704</td>
<td>Nutrition and Hunger in the Population</td>
</tr>
<tr>
<td>724</td>
<td>Healthy Lifestyle</td>
</tr>
</tbody>
</table>

Outcome #3

1. Outcome Measures

Long Term Individuals experience: Decreased overweight and obesity for youth/adults Decreased risk factors for nutrition-related health problems and chronic diseases that are affected by diet and physical activity for youth/adults A clear and comprehensive understanding of the genetic and physiological mechanisms of obesity and related chronic diseases Pharmacological and/or medical treatments to alleviate the effects of obesity and related diseases

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantitative Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>18000</td>
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</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

Get Moving-Get Healthy New Jersey

Obesity has reached epidemic proportions in the United States and is associated with rising levels of diabetes, heart disease, and other chronic health conditions among youth and adults. Poor food choices and lack of physical activity are major causes of this epidemic.

**What has been done**

Extension faculty and staff in the Family and Community Health Sciences and 4-H Youth Development Departments have implemented educational programs and campaigns to encourage youth and adults to change
dietary behaviors and increase physical activity.

Results
The NJ School Walking program was implemented in 10 schools across the state to 4th and 6th grade elementary school classes reaching 1,077 youth who walked 53,037 miles. 4-H youth were trained as 4-H Food Fitness Ambassadors to work with 4-H professionals to present Get Moving-Get Healthy at county fairs, community health fairs and educational programs. Family Fun Nights were implemented to engage the entire family in nutrition lessons and physical activities.

Adult and youth have engaged in the Walking Point to Point program. Survey results document that participants have:
- increased their consumption of fruits and vegetables, whole grains and low-fat dairy products
- decreased consumption of sugared beverages and high fat and sugar foods
- correctly identified appropriate portion sizes
- increased physical activity
- increased the number of family meals eaten together

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>701</td>
<td>Nutrient Composition of Food</td>
</tr>
<tr>
<td>702</td>
<td>Requirements and Function of Nutrients and Other Food Components</td>
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<td>Nutrition Education and Behavior</td>
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<td>704</td>
<td>Nutrition and Hunger in the Population</td>
</tr>
<tr>
<td>724</td>
<td>Healthy Lifestyle</td>
</tr>
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</table>

Outcome #4

1. Outcome Measures
Genetics, Taste Perception and Obesity-Medium Term Individuals incorporate skills/Change behaviors related to:
- Increased adoption of healthy food practices
- Increased consumption of fruits, vegetables, whole grains and low-fat dairy
- Increased participation in family meals
- Increased participation in physical activity
- Increased participation in family-related physical activity
- Increased use of new "campaign" website
- Improved understanding of the relationship between early nutrition and later risk for chronic disease
- Understand the process by which perilipins at the surface of lipid droplets control how much energy is released from the adipocyte at times of need
- Understanding how the intestines and body uptake and process dairy fat
- Identify genes, their protein product and how the proteins influence the way the body processes fat.

2. Associated Institution Types
- 1862 Extension
- 1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

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<th>Year</th>
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3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Genetics, Taste Perception and Obesity.

Obesity in the US is at epidemic proportions we are bombarded with food in many venues and eat. Overeating and disregard for serving size coupled with a variety of choices lead to excessive calories and ultimately obesity.
What has been done
NJAES researchers are investigating the linkages between genetic variation in bitter taste perception in food preferences, dietary habits, and body weight, to better identify individuals, especially women, who may be at risk for excess weight gain and obesity due to dietary causes. Taste blindness to the bitterness of 6-n-propylthiouracil (PROP) is a recessive trait that is controlled, in part, by the bitter receptor gene, TAS2R38. Those with the non-taster phenotype are less responsive to a range of oral sensations (fats, alcohol, bitterness and pungency) and have increased preferences for foods with these qualities, whereas those with the taster phenotype (medium- or super-tasters) show the opposite responses. Some studies suggest that PROP non-tasters habitually consume more discretionary fats, and energy as compared to PROP tasters. This dietary pattern could contribute to increased body weight, which we have observed among middle-aged, PROP non-taster women. Since exposure to a variety of high-fat/energy-dense, foods is known to promote excess energy intake and weight gain, we investigated if PROP non-taster women would be more susceptible to overeating in a buffet setting. Previous findings showed that all participants ate more when offered a buffet lunch as compared to free-access to a control lunch. However, non-taster women ate 88% more calories from the buffet meal whereas super-taster women ate only 38% more calories from the buffet meal. As a follow-up, researchers examined exposure to buffet meals over a 3-day period to determine the more long-term consequences of this type of dietary exposure.

Results
Interim analyses show that buffet feeding resulted in higher daily energy intakes and higher fat intakes in all subjects as compared to control feeding. Participants consumed more servings of grains, meats and added fats, and fewer servings of fruits and vegetables during buffet feeding than during the control condition. Thus, in addition to promoting higher energy intake, buffet feeding appears to have negative effects on fruit and vegetable consumption. Non-taster women consumed slightly more daily energy during the buffet condition than super-taster women. Also, non-taster women consumed more snacks than super-taster women during both the control condition and the buffet condition. These data support the idea that non-taster women habitually consume more energy when exposed to energy-dense foods, and snack foods may be contributing to this overconsumption. PROP status may be a useful tool for understanding the dietary patterns that lead to the development of obesity in women.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
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<tbody>
<tr>
<td>701</td>
<td>Nutrient Composition of Food</td>
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<td>Requirements and Function of Nutrients and Other Food Components</td>
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<td>Nutrition and Hunger in the Population</td>
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<tr>
<td>724</td>
<td>Healthy Lifestyle</td>
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Outcome #5

1. Outcome Measures

Promoting Healthy Eating to Prevent Excessive Weight Gain in Young Adults-Medium Term Individuals incorporate skills/Change behaviors related to: Increased adoption of healthy food practices Increased consumption of fruits, vegetables, whole grains and low-fat dairy Increased participation in family meals Increased participation in physical activity Increased participation in family-related physical activity Increased use of new "campaign" website Improved understanding of the relationship between early nutrition and later risk for chronic disease Understand the process by which perilipins at the surface of lipid droplets control how much energy is released from the adipocyte at times of need Understanding how the intestines and body uptake and process dairy fat Identify genes, their protein product and how the proteins influence the way the body processes fat.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure
3b. Quantitative Outcome

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</table>

3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**
Promoting Healthy Eating to Prevent Excessive Weight Gain in Young Adults

The development of a sustainable intervention to reduce risk of obesity in young adults using community-based participatory research is the focus of another multistate extension-based investigation. About 40% of US young adults are enrolled in college, and evidence is mounting that the transition to college life is a critical period of risk for weight gain. However, little is known about the extent to which university environments promote healthy eating, physical activity, and other healthy behaviors.

**What has been done**
NJAES researchers are collaborating with other institutions in a multistate project employing the PRECEDE-PROCEED health program and planning framework to develop effective interventions aimed at young adults. The project is now in the PRECEDE phase, where data are gather to assess factors affecting health and to create a "diagnosis" to guide development of health behavior change interventions to be implemented during the PROCEED phase. An inventory was developed to assess the prevalence, type and polarity of health-related advertisements; this inventory was used to assess advertising on and near the campus of a major university. Health-related advertising on and near this campus was prevalent, diverse with regard to type of health behavior, and mostly promoted good health practices. Another environmental assessment focused on university campus food, evaluating the nutritional quality of vending machine foods sold in academic buildings, student centers, and residence halls. Findings, based on the mean nutrient-density score, indicates that vending foods were not nutrient dense and do not support health snacking.

**Results**
In a recent survey of college students from 11 campuses, respondents generally reported adequate exercise but low fruit/vegetable intake. Over 90 percent of the respondents indicated that they were willing to improve their dietary choices, sleeping habits, exercise regiments, and better manage time/stress in order to maintain a healthy weight. Desired environmental changes on college campus were: reduce the cost of nutrient dense foods; increase healthy food options on campus; more walkable environment; and greater availability of exercise facilities. Investigators also modified the Nutrition Environment Measures Surveys to assess the food/eating environment in on-campus dining establishments, including student center food-courts, dining halls, and snack bars. This instrument was administered on 11 university campuses. Few significant differences by state/location emerged, but significant differences across institutions were noted among venues, enhancers and/or barriers of nutritional information, pricing, and portion size. Dining halls provide more healthful choices than other venues, but students may have difficulty making good choices.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
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<tbody>
<tr>
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<td>Nutrition and Hunger in the Population</td>
</tr>
<tr>
<td>724</td>
<td>Healthy Lifestyle</td>
</tr>
</tbody>
</table>
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

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned
   - After Only (post program)
   - Retrospective (post program)
   - Before-After (before and after program)
   - Time series (multiple points before and after program)
   - Comparisons between program participants (individuals, group, organizations) and non-participants
   - Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
   - Comparison between locales where the program operates and sites without program intervention

Evaluation Results

(No Data Entered)

Key Items of Evaluation

(No Data Entered)