Welcome to
Designing Meal Delivery Systems

January 25 , 2011

We will start at 2:30 PM. Please mute your phones #6

Presenter

Moderator

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DESIGNING MEAL DELIVERY SYSTEMS

A MOWAA NUTRITION TRACK WEBINAR

Presented by

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COURSE OBJECTIVES

On completion of this course, participants will:

❑ **Recognize that an effective meal delivery system is an open system which consistently interacts with and gains feed back from the surrounding environment;**

❑ **Appreciate the impact that the meal preparation and food delivery processes have on the safety and quality of the meals provided to clients, as well as on the desired outcomes for clients;**

❑ **Evaluate the impact of proposed food product and equipment purchases on the safety and quality of the meals provided to clients;**

COURSE OBJECTIVES

❑ **Understand the need to integrate all components of the meal delivery system to preserve the safety and quality of meals delivered to clients;**

❑ **Consider food safety and meal quality when determining program factors such as menu items food product selection, packaging systems and transit time.**

WHAT IS A SYSTEM??

> A collection of parts integrated to accomplish an overall goal
> Parts comprising a system include:
>> Inputs
>> Processes
>> Outputs
>> Outcomes
> There is ongoing interaction and feedback among these parts
> Open system has ongoing interaction and feedback with its environment

Food Delivery Programs as Systems

A meal delivery program is a system in that it has multiple and varied inputs which are processed in varying ways to produce the output of meals for older persons

MEAL DELIVERY SYSTEM GOAL

The overall goal of a meal delivery system is:

➢ Delivery of meals to program clients that are:

➢ *Nutritious*

➢ *High Quality*

➢ *Safe to Eat*

➢ *Enjoyed by the Client*

SYSTEM INTEGRATION

➢ All the parts of a meal delivery system MUST be integrated

➢ Each decision made about individual parts of a system impacts all of the other parts

➢ *Failure to consider the impact of any part of a system on other parts will likely be detrimental to the program's goal achievement*

THE SYSTEM'S ENVIRONMENT

Every system exists within a surrounding environment

- *Community Needs*
  - Clientele Assessment
  - Changing Clients and Client Needs – Program Flexibility
- *Type of Community*
  - Rural
    - Urban - small/medium or large/very large
- *Community Resources*
  - Financial Support
  - In-kind Support
  - Volunteer Support
  - Revenue Generation Opportunities

ENVIRONMENTAL CHANGE

- A program must continually interact with the surrounding environment to keep abreast of changes
- Programs must be flexible and, when necessary, make adjustments to keep the program viable
- The advent of the baby boomers will test a program's flexibility and ability to make creative changes

COMMUNITY NEEDS

> **Short Term Services**
> **Different Incidence of Illnesses**
> **Different Nutritional Requirements**
> **Different Food Preferences**
>> **Ethnic Foods**
>> **Different Food Flavors and Means of Cooking**
> **Different Skills and Equipment in Homes**
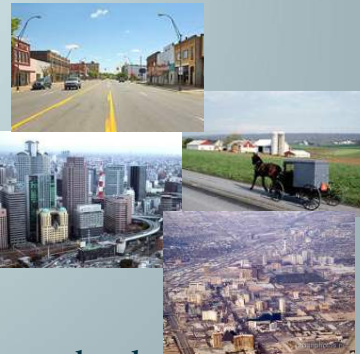
TYPE OF COMMUNITY

Whether the community is rural, small/medium urban or large/very large urban will impact system factors such as:
> **Program Size**
> **Type of Foods Served**
> **Food Resources**
> **Delivery Requirements**
>> **Route Distances**
>> **Delivery Types**
>> **Packaging**
>> **Delivery Vehicles**
>> **Delivery Personnel**
> **Future changes - 10, 15 , 20 years ahead**

COMMUNITY RESOURCES

> **Different types of community resources**
>> **Financial Contributions**
>> **In-Kind Contributions**
>> **Volunteer Time Contributions**
>> **Opportunities to Earn Revenue**

> **Community Resources may be related to type of community**

> **Don't overlook opportunities to earn revenue – preparing meals for other venues, for example**

COMMUNITY DONATIONS

> **All community donations can be used in some way by a program and should be considered valuable inputs**

> **Money donations are the most flexible type of community donations and are applicable to any type of system**

> **Some donations may have a direct impact on the type of system developed**

COMMUNITY RESOURCES

Community resources are essential for sustaining a meal delivery system. Thus, consistent positive interaction with the community (the system's environment) and feedback from the community (environment) is essential for a system's sustainment

FACILITIES – PROGRAM SPACE

➢ **What kind of facilities are available???**
  - ➢Office Space?
  - ➢Warehouse – Dry Stores Space?
  - ➢Food Production Space?
  - ➢Cold Storage – Refrigeration/Freezer – Space?

➢ **At a minimum, the available program facilities will influence food products used/type of foods served and may be a major consideration in contracting decisions.**

EQUIPMENT AVAILABLE

- Equipment is expensive. Thus equipment decisions will impact:
  - Resource Usage – Capital Investment
  - Continuing Cost of Meal Production, Packaging, and Delivery – have long term impact
- When considering equipment purchases, calculate a cost/benefit analysis and consider all alternatives before making a final decision.
- Specific equipment may be required for some system structure options.

FOOD PRODUCTION EQUIPMENT

- If food production equipment is available – have option to do some/all food production "from scratch"
  - Food production equipment may be available
    - In the program facilities
    - Other community facilities as in-kind community resources– churches, schools
- Key questions for this decision include:
  - Capacity of available equipment
  - Appropriate type of equipment
  - Availability of personnel with appropriate skills
  - Total meal cost (raw product + labor + all overhead)

FOOD PRODUCTION EQUIPMENT

If a program wants to prepare foods "from scratch", appropriate food production equipment with the capacity to meet the production quantity required to serve the number of clients anticipated by the program must be available. This equipment must be clean, sanitary, and in good working order.

FOOD STORAGE EQUIPMENT

- ➢ Food storage equipment is concerned with the availability of space for refrigerated, frozen, and dry stores products
- ➢ May include free standing refrigerators or freezers as well as walk-ins that may be added to the building
- ➢ Considers the type of racks and shelving in all types of storage areas – shelving related to product shelf life and potential for contamination

FOOD STORAGE EQUIPMENT

Food storage equipment must be considered when making system decisions as available food storage space and shelving can impact the type of products that can be used as well as the shelf life and potential for contamination of stored products.

FOOD PRODUCTS

- Food product selection has a major impact on all other aspects of the meal delivery system
- Food product selection may be impacted by facilities and equipment available
- Conversely food products desired by a program may impact decisions about facilities and equipment
- Food product decisions are integrated with all facets of the meal delivery program system -- impact all system decisions.

FOOD PRODUCT OPTIONS

Type of Food Product	"Raw Foods To Be Used In "From Scratch" Preparation	Refrigerated Prepared Foods Or Meals	Frozen Prepared Foods Or Meals	Shelf Stable Meals
Facilities – Equipment Required	Refrigerated, frozen, and dry storage; Separate refrigerated and/or frozen storage for raw foods and prepared foods; Array of food production equipment, including sinks and pot washing equipment; "Dish-up" equipment (steam table), possible wrapping/sealing equipment - large volume of meals; insulated or possibly heated or cooled transport equipment	Large capacity for refrigerated storage; dry storage; separate refrigerated areas may be required if foods purchased in bulk; ovens may be required if foods rethermalized at program site; "Dish-Up" equipment (steam/cold table) may be required if prepared products purchased in bulk; possible wrapping/sealing equipment - large volume - bulk foods repackaged for distribution; insulated or possibly heated or cooled transport equipment	Large capacity for frozen storage; dry storage; refrigerated storage if foods purchased in bulk, thawed, rethermalized, and repackaged for distribution at program site; "Dish-Up" equipment (steam/cold table) may be required if prepared products purchased in bulk: possible wrapping/sealing equipment - large volume - bulk foods repackaged for distribution; insulated or possibly heated or cooled transport equipment	Dry storage - areas to separate foods from other materials and supplies

FOOD PRODUCT OPTIONS

Type of Food Product	"Raw Foods To Be Used In "From Scratch" Preparation	Refrigerated Prepared Foods Or Meals	Frozen Prepared Foods Or Meals	Shelf Stable Meals
Personnel Considerations	Need personnel skilled in food preparation and portion control; need personnel trained in food safety and safe food handling practices	Need personnel trained in food safety and safe food handling practices; may need personnel trained in proper food rethermalization techniques and portion control	Need personnel trained in food safety and safe food handling practices; may need personnel trained in proper food rethermalization techniques and portion control	Need personnel trained in food safety and safe food handling practices

FOOD PRODUCT OPTIONS

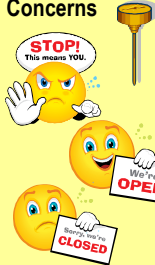| Type of Food Product	"Raw Foods To Be Used In "From Scratch" Preparation	Refrigerated Prepared Foods Or Meals	Frozen Prepared Foods Or Meals	Shelf Stable Meals
Advantages	Food product specifically tailored to program clientele and their needs; meals may have "home cooked" quality that may be desirable to clients; may be a lower per meal cost -- depending on product costs, waste management, portion control, & personnel costs	Meals purchased packaged, ready-to-serve - maintenance of meal quality, reduction in labor costs, portion size consistency, possible improvement in food safety; Prepared, refrigerated bulk foods purchases - potential meal quality consistency ; labor cost reduction; saving on capital equipment investment	Meals purchased packaged, ready-to-serve - maintenance of meal quality, portion size consistency, reduction in labor costs, possible improvement in food safety; Prepared, frozen bulk foods purchases - potential meal quality consistency ; labor cost reduction; saving on capital equipment investment	Reduction in labor costs, improved food safety, potential meal quality consistency, portion size consistency, savings on capital equipment investment

FOOD PRODUCT OPTIONS

Type of Food Product	"Raw Foods To Be Used In "From Scratch" Preparation	Refrigerated Prepared Foods Or Meals	Frozen Prepared Foods Or Meals	Shelf Stable Meals
Disadvantages	Inconsistency in food product quality; inconsistency in food portions; excess cost from product waste; multiple opportunities for food contamination; difficulties in hiring adequately skilled personnel	Possible higher food cost; increased cost for large amount of refrigerated storage; possible food safety problems if products mishandled; if bulk products purchased - excess cost from product waste, multiple opportunities for food contamination; inconsistency in portions	Possible higher food cost; increased cost for large amount of frozen storage space; possible food safety problems if products mishandled; if bulk products purchased - excess cost from product waste, multiple opportunities for food contamination; inconsistency in portions	High product costs; Reliance on clients to reconstitute correctly - possible product quality and consistency problems; possible food safety problem if foods mishandled by clients once reconstituted

FOOD PRODUCT OPTIONS

Type of Food Product	"Raw Foods To Be Used In "From Scratch" Preparation	Refrigerated Prepared Foods Or Meals	Frozen Prepared Foods Or Meals	Shelf Stable Meals
Quality Concerns	Poor food preparation; product deterioration of foods delivered hot; product deterioration when client reheats foods	Product deterioration if not held at proper temperatures; clients may not like the "TV dinner" type meals and foods; product deterioration from foods not rethermalized properly; product deterioration if food rethermalized at program site and delivered hot	Product deterioration if not held at proper temperatures; clients may not like the "TV dinner" type meals and foods; product deterioration from foods not rethermalized properly; product deterioration if food rethermalized at program site and delivered hot	Poor product quality if not reconstituted properly by client; may have poor taste - not "real food" taste for client

FOOD PRODUCT OPTIONS

Type of Food Product	"Raw Foods To Be Used In "From Scratch" Preparation	Refrigerated Prepared Foods Or Meals	Frozen Prepared Foods Or Meals	Shelf Stable Meals
Food Safety Concerns	Multiple opportunities for contamination & cross-contamination in storage and during preparation; foods out of time & temperature range during and after preparation, food temperatures not maintained properly during meal packaging and/or delivery; clients leaving foods out at room temperature if not eaten right away	Out of acceptable time & temperature range if not held at proper temperatures during storage and transport or client leaves meal on counter at room temperature; If bulk foods rethermalized and packaged at program site - multiple opportunities for contamination at all stages	Out of acceptable time & temperature range if not held at proper temperatures during storage and transport or client leaves meal on counter at room temperature; If bulk foods rethermalized and packaged at program site - multiple opportunities for contamination at all stages	Food spoilage and contamination if reconstituted and not eaten right away - time & temperature problems; contaminated water used for reconstitution

SYSTEM PROCESSES

➢ **Processes are internal to the system – transform system inputs into system outputs**

➢ **A meal delivery system has multiple processes such as:**

    ➢ **Food Preparation**

    ➢ **Menu Planning**

    ➢ **Food Product and Materials Selection and Acquisition**

    ➢ **Food Product and Materials Storage**

    ➢ **Packaging**

    ➢ **Meal Delivery**

FOOD PREPARATION PROCESS OPTIONS

Process Option	All Food prepared in program facilities	Some food prepared in program facilities; some purchased pre-prepared	All Food purchased pre-prepared in bulk-refrigerated, Frozen, or Shelf Stable	All food purchased pre-prepared pre-packaged into individual meals - refrigerated, frozen or shelf stable	Caterer produces hot meals; delivers to program in bulk	Caterer produces, packages, and delivers hot meals directly to clients
Food Production Equipment Require-ments	All types of production equipment necessary for all types of food product production required	Some production equipment required - equipment dependent of type of products produced in facilities	No production equipment required	No production equipment required	No production equipment required	No production equipment required

FOOD PREPARATION PROCESS OPTIONS

Process Option	All Food prepared in program facilities	Some food prepared in program facilities; some purchased pre-prepared	All Food purchased pre-prepared in bulk- refrigerated, Frozen, or Shelf Stable	All food purchased pre-prepared pre-packaged into individual meals - refrigerated, frozen or shelf stable	Caterer produces hot meals; delivers to program in bulk	Caterer produces, packages, and delivers hot meals directly to clients
Facility Space Require-ments	Large space for production, packaging, all types of storage, administrative offices, personnel areas (locker room, break areas)	Limited space for food production; large space for all types of storage; packaging area; administrative offices, moderate space for personnel areas	No space for food production; large space for all types of storage; packaging area; administrative offices, moderate space for personnel areas	No space for food production; large space for refrigerated and/or frozen storage; limited space for dry storage and for packaging area; administrative offices; limited space for personnel areas	No space for food production; limited space for all types of storage; moderate space for packaging area (hot steam tables); administrative offices; limited space for personnel areas	No space for food related activities; administrative offices; limited space for personnel areas

FOOD PREPARATION PROCESS OPTIONS

Process Option	All Food prepared in program facilities	Some food prepared in program facilities; some purchased pre-prepared	All Food purchased pre-prepared in bulk- refrigerated, Frozen, or Shelf Stable	All food purchased pre-prepared pre-packaged into individual meals - refrigerated, frozen or shelf stable	Caterer produces hot meals; delivers to program in bulk	Caterer produces, packages, and delivers hot meals directly to clients
Probable per meal Food Cost	Low	Moderate	Moderate to High	High	High	Very High
Probable per meal overhead costs	High	Moderate to High	Moderate	Moderate	Moderate to Low	Low
Personnel Requirements	High; specialized skill required	Moderate to high; some specialized skill likely required	Moderate; limited specialized skill required	Low - few, if any, specialized skills required	Low; limited specialized skill required	Low - few specialized skills required

FOOD PREPARATION PROCESS OPTIONS

➢ There are "trade-offs" between the types of costs and the resources required among the different food processing options that might be selected by a meal delivery program

➢ The cook-chill (cook-freeze) process is another option available to very large programs

  ➢ Foods prepared "from scratch", then quickly chilled or frozen

  ➢ Foods chilled/frozen either in bulk or as individual meals

  ➢ System not cost effective for small/medium programs

  ➢ Could be an option if could also prepare meals for other community entities

FOOD PREPARATION PROCESS OPTIONS

Just because a meal delivery program contracts with a caterer for food and/or meal services, it is not relieved of responsibility for the quality and safety of the meals served. The program still has responsibilities and related overhead costs to be sure that the caterer's services are monitored to ensure performance to contract standards . Remedial actions must be taken when there are deviations from the contract standards.

PRODUCT SELECTION AND STORAGE

The process of selection and acquisition (purchasing) of food products and materials, such as packaging materials, and the storage process for foods and materials will not be discussed here as these processes are covered in the Food Cost Control course that is part of this certification program.
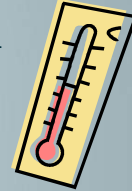
PACKAGING PROCESS

- Hot food packaging process:
  - Required use of steam tables or similar equipment to keep foods at proper temperatures
    - Packaged at 180 degrees F or higher
  - Foods must be packaged/plated quickly
    - Maintain appropriate temperatures
    - Preserve product quality
  - Packaged/plated foods must be sealed quickly
  - Sealed foods must be placed into insulated or heated containers quickly
  - Delivery process must take place as soon as possible

PACKAGING PROCESS

- ➢ **Critical issues for hot food packaging and delivery are:**
  - ➢ **Maintaining temperature levels so the food is delivered to the client at a minimum temperature of 140 degrees F**
    - ➢*Temperature maintenance is <u>CRITICAL</u> for food safety*
  - ➢ **Having the shortest possible delivery time for transporting the meals from the program site to the client**
    - ➢*Short delivery times are <u>ESSENTIAL</u> for temperature maintenance (food safety) and for product quality as the food continues to "cook" throughout the packaging, sealing, storage, and delivery processes.*

PACKAGING PROCESS

- ➢ **Packaging process is simplified for cold items**
- ➢ **Cold items:**
  - ➢ **Can be packaged well ahead of delivery time and will maintain temperature when stored correctly**
  - ➢ **Can be packed for delivery well ahead of time and stored in refrigerators or freezers until needed**
  - ➢ **Are easier to pack to maintain safe temperature level of less than 40 degrees F (< 10 degrees F for frozen) for longer delivery times**
- ➢ **Food quality does not deteriorate in chilled or frozen products.**

PACKAGING PROCESS

> Pre-packaged refrigerated, frozen, or shelf-stable meals ⟹ the simplest packaging process

> No packaging required other than to pack them for the delivery process, along with beverages and any accompanying side items

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PACKAGING EQUIPMENT

> Some type of packaging equipment needed by all programs unless contracting for 100% of services. Might include:
> > Steam Tables for hot food plating
> > Cold tables for packing cold items
> > Equipment to wrap and seal plated meals
> > Insulated containers for packing meals
> > Heated or cooled containers for packing meals

> Factors impacting packaging equipment needs
> > Program size
> > Type of meal to be delivered
> > Packaging materials selected
> > Transit time for meal deliveries
> > Mode of meal delivery

PACKAGING MATERIALS

Factors to consider in selection of packaging materials include:

➢ Food item(s) to be packages

➢ Temperature of the item(s) to be packaged

➢ Whether or not clients need to rethermalize the food prior to eating

➢ Type of equipment the client(s) have available for food rethermalization

➢ Amount of liquid in the food

➢ Client physical & mental capabilities

PACKAGING MATERIALS OPTIONS

Materials	Aluminum containers	Aluminum Foil (cover containers)	Ovenable Paperboard Containers	Ovenable Plastic Containers	Plastic film (cover containers)	Soup Cups	Portion Cups
Holds Heat Well	No	Yes	Yes	No	Yes	Yes	No
Usable in oven	Yes	Yes	Yes - to 180˚F sealed; 400˚F open	Yes to 350˚F for 30 minutes on sheet pan	Yes - to 180˚F	No	No
Usable in Microwave	No	No	Yes	Yes	Yes	Yes	No
Usable in Freezer	Yes	Yes	Yes - good to -40˚F	Yes - good to -40˚F	Yes	No	Yes
Recyclable	Yes	Yes	No	Yes	No	No	No
Bio-degradable	No	No	Yes	No	No	No	No

PACKAGING MATERIALS

- Packaging materials selection must be integrated with type of food product used
- Packaging materials decision not made until decision made regarding type of food products to be used
- Pre-Packaged meals eliminate the need for further meal plating and packaging materials for the main entrée plate
- May still need packaging materials for side items

PACKAGING MATERIALS OPTIONS

The packaging materials selected will impact the packaging process selected for the system. Some of these materials lend themselves to automated machine packaging; others do not. Programs serving a large volume of meals need to consider the automation factor, as well as the other factors related to the choice of packing materials.

PACKING FOR DELIVERY

- ➢ **Hot Meals:**
    - ➢ Short delivery times – insulated containers
    - ➢ Longer delivery routes/times – heated "hot" boxes
    - ➢ Pack meals tightly in container
        - ➢Reduce air circulation around meals
- ➢ **Test containers on longest route with meal least likely to maintain temperature before purchasing**
- ➢ **Large program – long delivery times for multiple clients – consider a specialized van to accommodate electrically heated "boxes".**

PACKING FOR DELIVERY

- ➢ **Cold Meals, Beverages and Side Items:**
    - ➢ Insulated containers and/or coolers usually adequate
    - ➢ Use frozen gel packs or "blue ice" to keep foods chilled
    - ➢ Do not use ice – possible contamination of foods from melting ice
    - ➢ Can used chilled "carry boxes" with frozen packs for chilling
    - ➢ Consider dry ice for frozen foods to be delivered on long routes

PACKING FOR DELIVERY

- If meals are composed of a combination of hot and cold items, is it ESSENTIAL that the meal components be packed separately.
- Hot items must be packed into a HOT container; cold items in a COLD container.
- Delivery person combines items correctly to make the complete meal at the client's home.

MEAL DELIVERY PROCESS

- Factors to consider when making meal delivery process decisions:
  - How close together do clients live?
  - How difficult is it to reach clients' homes?
  - What type of vehicles are available for meal delivery?

  - How many vehicles (of each type) are available?
  - Are the meals to be delivered hot or cold?
  - What kind of containers are being used to pack the meals for delivery?

MEAL DELIVERY PROCESS

Key Consideration:

> *Meals need to reach the clients at safe temperatures and must not be contaminated in any way during the delivery process*

- **Consider the route structure carefully**
  - **Keep delivery times as short as possible for hot meals**
  - **Rural areas with very long delivery distances and route times likely require the use of refrigerated, frozen, or shelf stable meals to preserve meal safety and food quality**

MEAL DELIVERY PROCESS

Key Consideration: Who is going to deliver the meals?

- **Once meals have left the program site with the delivery persons, there is no opportunity for meal "recovery"**
- **All delivery personnel must have training in:**
  - **Food handling and food safety**
  - **How to observe and check on clients' condition**
  - **How to handle problems observed or difficulties that arise during the delivery period**

MEAL DELIVERY PROCESS

➢ **If volunteers are making the meal deliveries and they are using their own vehicles, need to:**
  - ➢ Consider insurance coverage
  - ➢ Consider cleanliness of vehicle interior and the trunk – wherever the meal containers are being placed
  - ➢ Have a process in place for periodically inspecting delivery vehicles
    - ➢ Make sure they are well maintained and clean
    - ➢ Vehicle cleanliness essential to prevent meal contamination
    - ➢ Inspect any vehicle before a volunteer makes his/her first deliveries
➢ **Clean and sanitize any program-owned delivery vehicles daily as soon as they return from delivery route**

PROGRAM VALUE

✔

The value of the system (the meal delivery program) to the environment (the community) can be evaluated by reviewing the outcomes achieved by the system's outputs.

OUTCOMES AND GOAL ACHIEVEMENT

➢ **Goal: Provide Safe Meals**
  - ➢ **Were there any reported incidents of foodborne illness tracked back to the program?**
  - ➢ **Did quality control checks show food temperatures maintained throughout the system?**
  - ➢ **Were foods handled in such a way that contamination was prevented?**

OUTCOMES AND GOAL ACHIEVEMENT

➢ **Goal: Did clients maintain or improve their health status?**
  - ➢ **Were they able to remain longer in their homes?**
  - ➢ **Was unplanned weight loss reduced?**
  - ➢ **Was the incidence of illness reduced?**

THANK YOU!!!

QUESTIONS????

For any further questions or a copy of These overheads, you can email me at: bmccool@earthlink.net

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