Cancer Nutrition Research Presentation
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Providing Marketing Research with Wisdom, Honesty, and Precision
Background

Objectives
The primary objective is to gain insights from cancer patients on food and beverage habits and preferences since beginning treatment.

Specifically, the research provides:

- A profile of patients on active cancer treatment
- The appeal of different foods and beverages, products and services
- Recipes or food dishes that appeal to them during treatment
- Differences, if any, by type of cancer patient, demographics or behaviors

Results will be used to develop recipes or tips, products or services that will appeal to cancer patients.

Methodology
About 1,200 surveys were collected and analyzed from seven medical centers from April to Dec. 2012:

- Roswell Park Cancer Institute
- New York University Clinical Cancer Center
- Dana Farber/Brigham and Women’s Cancer Center
- Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins
- University of Chicago Comprehensive Cancer Center
- Mayo Clinic Cancer Center
- Cedars-Sinai / Samuel Oschin Comprehensive Cancer Institute
Participant Profile

Survey participants represent a mix of patients with different types of cancer.

- Gastrointestinal (16%)
- Lung (14%)
- Breast (19%)
- Hematologic Malignancies (21%)
- Other Solid (29%)

Gynecological (42%)
Prostate, kidney or bladder (22%)
Head or neck (17%)
Brain or spinal (13%)
Lymphoma (40%)
Multiple myeloma (35%)
Leukemia (27%)

On average, they were first diagnosed about nine months ago
- Almost one-half of them (47%) were diagnosed more than one year ago.
- About 10% were diagnosed within the past two months.
Participant Profile, Cont’d.

Participants represent a good mix of gender, age and ethnicity.

Most participants are undergoing chemotherapy.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Total</th>
<th>GI</th>
<th>Lung</th>
<th>Other Solid</th>
<th>Breast</th>
<th>Hema</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1198)</td>
<td>(182)</td>
<td>(169)</td>
<td>(343)</td>
<td>(226)</td>
<td>(255)</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>90</td>
<td>99</td>
<td>97</td>
<td>90</td>
<td>85</td>
<td>89</td>
</tr>
<tr>
<td>Radiation</td>
<td>15</td>
<td>11</td>
<td>27</td>
<td>25</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Surgery</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>14</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Hormone Therapy</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td>13</td>
<td>*</td>
</tr>
<tr>
<td>Transplant</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>*</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>None / between</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>treatments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Base sizes: (1198) (182) (169) (343) (226) (255)

Average age: 60 years
About 39% of the cancer patients have other health problems.

- Diabetes (13%)
- Heart disease (10%)

Most patients are taking medications or supplements.

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescriptions</td>
<td>71%</td>
</tr>
<tr>
<td>Vitamins/minerals</td>
<td>69%</td>
</tr>
<tr>
<td>Nutritional supplements</td>
<td>35%</td>
</tr>
<tr>
<td>Dietary supplements/herbs</td>
<td>29%</td>
</tr>
</tbody>
</table>

- Anti-nausea (45%)
- Pain medication (33%)
- Steroids (26%)
- Vitamin D (30%)
- Calcium (23%)
- Multi-vitamins (22%)
- Ensure/Boost (20%)
- Fish oil (12%)
- Herbal tea (9%)
Almost all (84%) of cancer patients experience some symptoms. Symptoms are most likely to occur among those ...

- Experiencing less energy since beginning treatment
- Losing weight unintentionally
- Consuming less food and beverages since beginning treatment

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant fatigue</td>
<td>41%</td>
</tr>
<tr>
<td>Constipation</td>
<td>33%</td>
</tr>
<tr>
<td>Poor appetite</td>
<td>31%</td>
</tr>
<tr>
<td>Dry mouth</td>
<td>27%</td>
</tr>
<tr>
<td>Nausea and/or vomiting</td>
<td>26%</td>
</tr>
<tr>
<td>Gas/bloating</td>
<td>23%</td>
</tr>
<tr>
<td>Reflux/indigestion</td>
<td>21%</td>
</tr>
<tr>
<td>Quickly feeling full</td>
<td>21%</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>20%</td>
</tr>
<tr>
<td>Shortness of breath, no oxygen</td>
<td>17%</td>
</tr>
<tr>
<td>Increased sensitivity to smells</td>
<td>17%</td>
</tr>
<tr>
<td>Mouth/tongue sores</td>
<td>12%</td>
</tr>
<tr>
<td>Trouble swallowing</td>
<td>9%</td>
</tr>
<tr>
<td>Sore throat</td>
<td>8%</td>
</tr>
<tr>
<td>Severe pain (6+ out of 10)</td>
<td>7%</td>
</tr>
<tr>
<td>Decreased sense of smell</td>
<td>6%</td>
</tr>
<tr>
<td>Sore/bleeding gums</td>
<td>6%</td>
</tr>
<tr>
<td>Trouble chewing</td>
<td>3%</td>
</tr>
<tr>
<td>Shortness of breath, require oxygen</td>
<td>2%</td>
</tr>
<tr>
<td>Loss of teeth</td>
<td>2%</td>
</tr>
<tr>
<td>None</td>
<td>16%</td>
</tr>
</tbody>
</table>
Changes in Weight, Energy and Activities

Most patients (88%) have had unintentional changes in weight.

For Breast patients, weight changes are about equal...
- 32% lost weight
- 29% gained weight

Those with less energy are the most likely to have lost weight.

Since beginning treatment, most patients have less energy, are working less often and are exercising less often. Those who eat/drink less often have less energy and activity levels.
Food Shopping and Preparation

Most patients shop for food all or some of the time, are able to prepare meals, and consider themselves to be the primary food preparer.

Those with less energy and unintentional weight loss are the least likely to shop for food and/or prepare meals.
Food and Beverage Consumption

Since beginning treatment, food appetites and consumption have *lessened*, especially among those with less energy and/or unintentional weight losses.

The desire for beverages and beverage consumption (except alcoholic beverages) have *increased*. 
Taste Sensitivities

About 40% have increased taste sensitivities; 18% have decreased taste sensitivities.

**Increased Sensitivities**
- Metallic: 19%
- Salty: 15%
- Sweet: 14%
- Bitter: 10%
- Sour: 8%
- None of the above: 59%

**Decreased Sensitivities**
- Sweet: 10%
- Salty: 9%
- Bitter: 5%
- Sour: 5%
- None of the above: 82%

Increased taste sensitivities are most likely to occur among...
- Women
- Adults 18 to 74 years
- Those with less energy and unintentional weight losses
- Those with reduced food and beverage consumption
Foods Avoiding

Eight out of ten patients avoiding some types of foods, with 47% avoiding foods that they used to eat due to medical advice and 57% due to intolerance.

Patients avoiding food most are those with less energy and those with unintentional weight losses, women and adults 18 to 74 years.

Other foods being avoided are high fat/rich, processed, hard to digest, high sugar content, cold temperatures, raw fish, shellfish and non-organic fruits/vegetables.
Foods Avoiding, Cont’d.

- **Acidic / spicy foods**
  - Spicy foods, Cajun, Creole
  - Pizza
  - Tomato sauce, salsa, chili
  - Garlic, onions, hot peppers, hot sauces
  - Spicy food because it makes my mouth sore
  - Grapefruit

- **Fried / greasy / high fat or rich foods**
  - Any dishes that are too rich, oily or greasy, e.g. pastas with creams, chicken wings
  - Fats, including cooking oil and fatty oils

- **Processed / salty foods**
  - Processed foods; preservatives; deli meats; white bread

- **Foods hard to digest or hard to chew**
  - Constipation issues: anything high in fiber, breads, dairy
  - Hard to chew foods: chips, crackers, stringy vegetables, red meat, steak

- **Sweets and foods with high sugar content**

- **Cold beverages or cold foods**
  - Ice cream or frozen desserts; ice water or cold beverages
  - Can’t have cold drink or ice after the chemo treatments... it burns my throat to drink them

- **Others**
  - Fresh fruit and veggies that are difficult to clean by soap and water, such as berries, grapes, grape tomatoes, salad
  - Foods with skin, seeds, pulp, whole grains

*Sample of verbatim comments shown.*
Most cancer patients are also avoiding some types of beverages.

Coffee is especially being avoided among those with low energy levels and weight losses. Lung patients are the least likely to avoid coffee.

Caucasians are less likely to avoid soda/pop/tonic than others.
Aromas/Smells Avoiding

About one-half (48%) of all patients are bothered by aromas/smells.

Aromas/smells are most likely to bother...

- Women and Breast patients
- Adults 18 to 74 years
- Those with less energy, weight losses and dietary changes

Foods and Beverages: garlic, onions, coffee
Other smells: cigarette/cigar smoke, gasoline, scented candles/incense
Food Preferences

Most patients do not have a food temperature preference.

<table>
<thead>
<tr>
<th>Hot</th>
<th>Room Temp.</th>
<th>Cold</th>
<th>No Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>22%</td>
<td>11%</td>
<td>3%</td>
<td>65%</td>
</tr>
</tbody>
</table>

Those with stronger food temperature preferences are...

- Those with less energy and those with weight losses
- African Americans (43% prefer hot foods)
- Adults 75+ years (30% prefer hot foods)

Among those with a preference, food is most appetizing when prepared at home.

<table>
<thead>
<tr>
<th>Prepared at Home</th>
<th>Eaten Out</th>
<th>Brought In</th>
<th>No Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>43%</td>
<td>13%</td>
<td>5%</td>
<td>39%</td>
</tr>
</tbody>
</table>

Some differences are found...

- African Americans are most likely to find food more appetizing when prepared at home (52%).
- Those who had weight gains prefer eating out most (19%).
- Breast cancer patients are least likely to find food more appetizing when prepared at home.
- Women are most likely to find food more appetizing when brought in (16%).

*If I can smell cooking (even good cooking), it kills my appetite.*
Foods Preferring

Almost all of the cancer patients have specific types of food they would prefer to eat.

<table>
<thead>
<tr>
<th>Food Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some fruits and vegetables</td>
<td>69%</td>
</tr>
<tr>
<td>Soups</td>
<td>62%</td>
</tr>
<tr>
<td>Poultry</td>
<td>61%</td>
</tr>
<tr>
<td>Pasta</td>
<td>55%</td>
</tr>
<tr>
<td>Fish</td>
<td>53%</td>
</tr>
<tr>
<td>Meat</td>
<td>46%</td>
</tr>
<tr>
<td>Dairy</td>
<td>44%</td>
</tr>
<tr>
<td>Sweets</td>
<td>41%</td>
</tr>
<tr>
<td>High fiber foods</td>
<td>35%</td>
</tr>
<tr>
<td>Crunchy foods</td>
<td>29%</td>
</tr>
<tr>
<td>Salty foods</td>
<td>26%</td>
</tr>
<tr>
<td>Asian</td>
<td>26%</td>
</tr>
<tr>
<td>Vegetarian</td>
<td>24%</td>
</tr>
<tr>
<td>Spicy foods</td>
<td>22%</td>
</tr>
<tr>
<td>Mexican</td>
<td>22%</td>
</tr>
<tr>
<td>Chewy foods</td>
<td>21%</td>
</tr>
<tr>
<td>Citric/acidic foods</td>
<td>19%</td>
</tr>
<tr>
<td>Bland foods</td>
<td>14%</td>
</tr>
<tr>
<td>Greasy/fried foods</td>
<td>13%</td>
</tr>
<tr>
<td>Indian</td>
<td>10%</td>
</tr>
<tr>
<td>Soy</td>
<td>9%</td>
</tr>
<tr>
<td>None of the above</td>
<td>9%</td>
</tr>
</tbody>
</table>

Some differences are noted...

- Those with more energy are more likely to find more foods appealing.
- Those eating less food since beginning treatment are least likely to prefer fish and meat.
- Those 75+ years prefer soups, poultry, pasta and meat, while others prefer more ethnic/spicy foods.
- African Americans have a strong preference for fish (70%).
Foods Preferring, Cont’d.

Patients describe foods that are most appealing to them.

- **Carb-heavy foods**
  - Pasta, noodles, macaroni, mac and cheese
  - Linguine, spaghetti, fettuccini, lasagna
  - Casseroles, rice, risotto
  - Cereal, breads, crackers, rolls, bagels, muffins
  - Potatoes, mashed potatoes, sweet potatoes

- **“Comfort” foods**
  - Soups, homemade soups, stews, chili, eggs, pastas/carb-heavy foods
  - Warm, comforting, simple
  - I love comfort foods right now

- **“Soft, Smooth and Creamy” foods**
  - Smoothies, shakes, frozen yogurt, ice cream, custards, pudding, rice pudding, jello
  - Cottage cheese, baby food, apple sauce, yogurts, creamy soups, oatmeal, eggs
  - Foods which are easy to swallow, don’t require lots of chewing
  - Soft easily digested versions of old time favorites

- **Sweets**
  - Chocolate, cookies, candy, cakes, fruit pies, cheesecake
  - Ice cream, frozen yogurt, sherbet, smoothies
  - I seem to have much more of a sweet tooth since I’ve been on Chemo
  - Maybe slight increase in sweets because I can get away with it more than I could before!
Foods Preferring, Cont’d.

Although spicy foods are appealing to many patients, others prefer bland foods.

- **Spicy or flavorful foods**
  - Asian, Mexican, Indian (curry), Thai, Chinese, Italian, Pizza
  - Full flavor foods
  - I like to add herbs to my food to keep them from being bland.
  - I enjoy Mexican food because it is spicy.
  - Strong craving for sweets or spicy foods, e.g., hot stuffed banana peppers

- **Salty**
  - Popcorn, potato chips, nuts, salty chips, crackers, pretzels
  - Salty foods are appealing

- **Bland foods**
  - During the first week I prefer bland foods
  - Mashed potatoes, rice, toast, bananas, eggs, chicken soup
  - I have been able to eat Campbell’s creamy cup of chicken soup, oatmeal
  - Bland – easily digestible
  - Nutritional, bland, simple
  - Bland with salty rather than spicy nature
Foods Preferring, Cont’d.

Specifically, meats, fish, fruits and vegetables have strong appeal.

- **Meats / Seafood**
  - Steak, beef, chicken, poultry, fish, seafood
  - Fresh fish, dark meat chicken, or turkey
  - Baked chicken
  - I was anemic for a while and craved red meat, spinach, any iron rich foods
  - Tend to crave red meat, such as hamburger, more often
  - Broiled, baked or grilled. Try to avoid greasy/fried foods

- **Fruits and vegetables**
  - Bananas, apples, oranges, watermelon, most melons, grapes
  - Potatoes, sweet potatoes, squash, spinach, string beans
  - Bok choi, cabbage, kale, carrots, green vegetables, avocados
  - Fresh fruits and veggies, salads
  - Canned, dried, frozen fruits
  - Cold fruit that has been prepared bite size
Almost all participants select specific beverages they prefer to drink.

<table>
<thead>
<tr>
<th>Beverage</th>
<th>Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>75%</td>
</tr>
<tr>
<td>Fruit juice</td>
<td>48%</td>
</tr>
<tr>
<td>Tea</td>
<td>44%</td>
</tr>
<tr>
<td>Coffee</td>
<td>40%</td>
</tr>
<tr>
<td>Milk</td>
<td>36%</td>
</tr>
<tr>
<td>Soda, pop or tonic</td>
<td>26%</td>
</tr>
<tr>
<td>Flavored water</td>
<td>26%</td>
</tr>
<tr>
<td>Vegetable juice</td>
<td>24%</td>
</tr>
<tr>
<td>Sports drinks</td>
<td>19%</td>
</tr>
<tr>
<td>Wine</td>
<td>11%</td>
</tr>
<tr>
<td>Beer</td>
<td>7%</td>
</tr>
<tr>
<td>Soy milk</td>
<td>5%</td>
</tr>
<tr>
<td>Other alcoholic drinks</td>
<td>4%</td>
</tr>
<tr>
<td>None of the above</td>
<td>7%</td>
</tr>
</tbody>
</table>

- GI patients are most likely to prefer fruit juices (58%).
- Women, Breast patients and African Americans prefer tea the most.
- Coffee appeals most to adults 75+ years.
- Sports drinks appeal most to those who have lost weight and men.
Helpfulness of Products and Services

Recipes and written information would be most helpful to cancer patients.

- Recipes that help you manage your symptoms
  - Extremely: 30%
  - Very: 29%
  - Somewhat: 20%
  - Slightly: 7%
  - Not at all: 15%

- Written information on eating better during cancer treatment
  - Extremely: 29%
  - Very: 30%
  - Somewhat: 20%
  - Slightly: 8%
  - Not at all: 13%

- Pre-packaged or prepared meals to purchase that are full of nutrients needed to help you feel better
  - Extremely: 25%
  - Very: 21%
  - Somewhat: 22%
  - Slightly: 10%
  - Not at all: 22%

- Videos on creating easy, highly nutritional meals
  - Extremely: 16%
  - Very: 16%
  - Somewhat: 23%
  - Slightly: 14%
  - Not at all: 30%

- Liquid nutrition that tastes like food instead of milk shakes
  - Extremely: 9%
  - Very: 9%
  - Somewhat: 17%
  - Slightly: 10%
  - Not at all: 55%

Patients finding these products and services most helpful are...

- Those with less energy and unintentional weight loss
- Breast patients
- Adults under 75 years
- Non-Caucasians
Considerations and Suggestions

The majority of cancer patients have less energy. Patients who have less energy or have lost weight unintentionally since beginning treatment are the most likely to have symptoms and are the most likely to have decreased appetites and lower food consumption. These patients are most in need of nutrients to help them feel better and to help increase energy levels.

Recipes

- Create recipes that are easy to prepare and do not require a lot of effort and energy.
- Generate recipes to better manage cancer patients’ symptoms and provide written information (or an app) on how to eat better during cancer treatment.
- Take into consideration the aromas/smells that might arise when cooking since many patients, especially breast patients, find them annoying.
- Design recipes bearing in mind the recipes suggested by cancer patients and these categories:
  - Carb-heavy foods
  - Comfort foods
  - Soft, smooth and creamy foods
  - Sweets
  - Spicy or flavorful
  - Salty
  - Bland
  - Meats/seafood
  - Fruits/vegetables
- Develop liquid nutrition that tastes good, especially for those on liquid only diets; breast and hematological patients who have increased desire for beverages.
Considerations and Suggestions

Prepared Meals

- Adjust recipes so as to develop pre-packaged or prepared meals that are designed, labeled and promoted specifically for cancer patients.
- Design foods or beverages geared to specific types of patients (e.g., avoiding constipation-causing items with lung cancer patients or diarrhea-causing menu items with gastrointestinal cancer patients), to address different symptoms and patients’ other health concerns, such as diabetes and/or heart disease.
- Label and identify foods, e.g., low salt, low sugar, low fat, all natural (not processed), easy to digest, organic, etc.

Hospital Menus

- Adjust recipes to develop menus for hospitalized cancer patients, offering a selection of item(s) for each of the different desired categories (i.e., spicy, bland, etc.) and labeling them as such (e.g., spicy dish of the day, bland dish of the day, etc.).
- Serve many hot items, given that hot food items are most desired, among those having a food temperature preference.
- Limit greasy and fried food offerings since about one-half of patients are avoiding these types of foods.