Consumer Research Methods

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Wendy Umberger, Ph.D.

Exec Director & Professor

Centre for Global Food and Resources

Australian Government

Australian Centre for International Agricultural Research

THE UNIVERSITY of ADELAIDE

Market Research

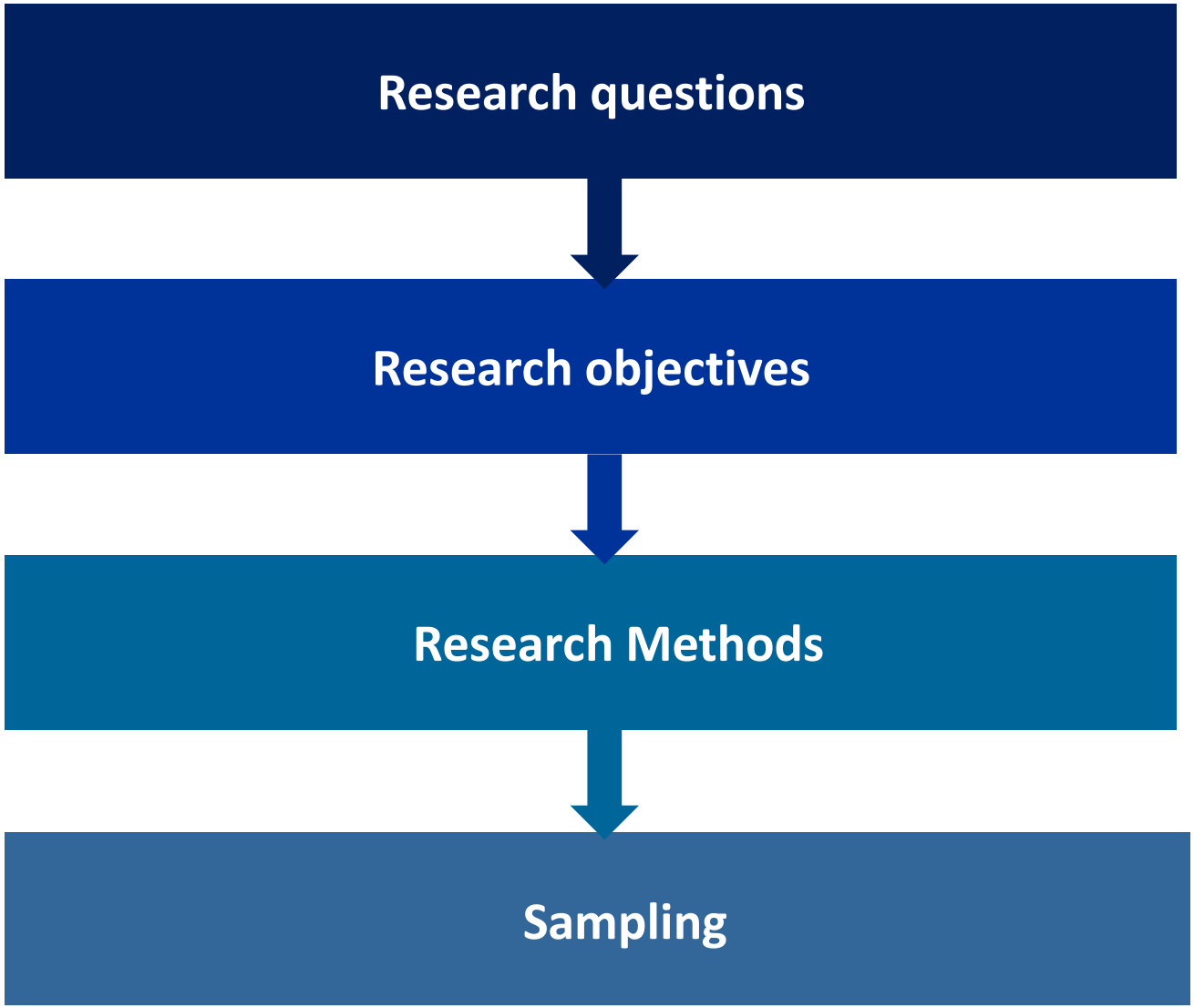
- Determine the 4 P's for positioning
  - Product, price, place, promotion

- Research problem
- Research hypotheses are statements of the relationship between variables
  - they must carry clear implications for testing the stated relations
- Determine methods to test research hypotheses
  - Budget, time, existing data

Consumer research methods

- Research Design
- Research Questions & Objectives
- Research Methods
- Issues with Consumer research
- Qualitative
- Quantitative
  - Secondary data
  - Primary data

Research Design



Research Questions

Choose ***clear, focused, concise*** and **relevant** questions around which you will center your research

Research questions guide the formulation of research objectives

They help researchers work toward supporting a specific, arguable thesis

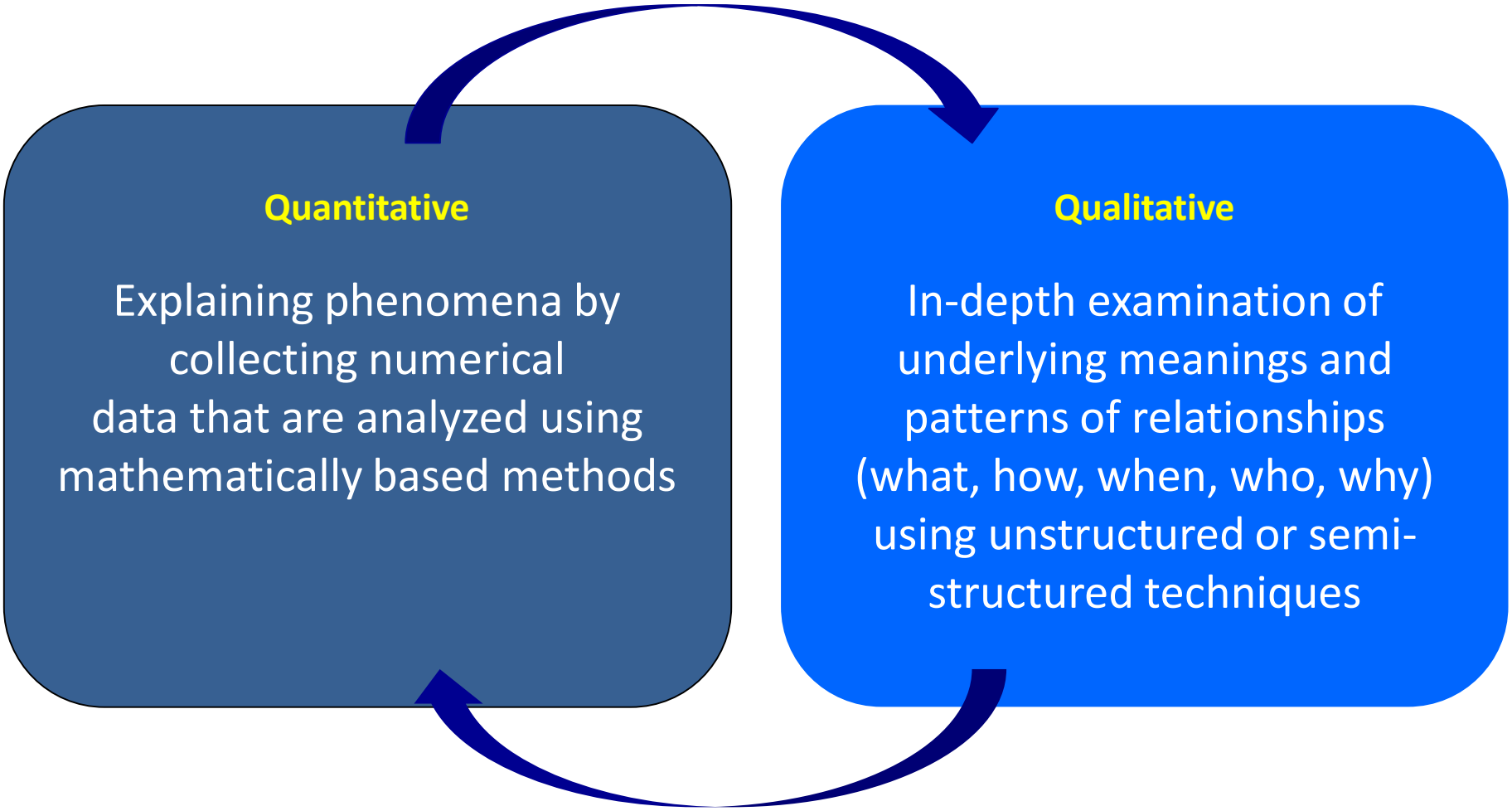
Research Objectives

Choose ***clear, focused*** and ***concise***
research objectives

Research objectives explain how research
questions are going to be answered; they should be closely
related to the research questions

Research objectives will guide the research process (methods,
data collection, data analysis, writing)

Research Methods



Issues with Food Consumer Research

1. Consumers are often unable to articulate the actual value of food attributes or information
   - Often hard to predict or explain utility for food attributes
   - Unconscious of how they use information
2. Consumers tend to have heterogeneous preferences and utility for food attributes,
   - Markets are segmented, not "one-size-fits-all"
   - Based on attitudes – not necessarily demographics
3. Distribution of value through the value chain is ambiguous
   - Just because consumers say they value something doesn't mean that producers will benefit

Consumer Research Methods:

What do we want to measure?

- Knowledge, attitudes, awareness, perceptions, preferences, relative importance, value, willingness-to-pay?
- Current behaviour?
  - Where are consumers shopping for specific products and why?
  - What is important when purchasing certain products?
  - What are current issues (e.g. what could be improved?)
  - What do consumers use to determine quality?
- Expected behaviour?
  - Predicting demand for a new product?
    - Price and quantity
- Quantitative: Stated preference vs. revealed preference
  - Revealed preferences not usually available in a R4D context
    - Panel data, scanner data, experiments, field tests

Qualitative

- Small number of non-representative cases
- Exploratory
- Useful for formulating research question and developing hypotheses
- Small samples
- Representative???
- Open-ended
- Less time, frequent turnaround
- Less expensive (generally)

Quantitative

- Usually a large number of cases representing the population of interest
- Descriptive
- Large samples
- Representative – depends on sampling
- Close-ended
- More time required
- If sample is appropriate you can design the marketing mix and understand segments in the market
- Analysis requires statistical and econometric skills

Appropriate Qualitative Research Objectives

- Not for measuring, usually exploratory
  - Understand factors motivating behavior
  - Determine key words, level of understanding, general attitudes, beliefs
  - Discuss opportunities/issues
  - Examine reactions to alternative ideas .
  - Develop communications strategies

  - Gain input to quantitative research
    - Identify variables to be measured in quantitative research
  - Understand quantitative research results

General categories of questions

The really important part is understanding more than the "what" (behaviour, attitudes, preferences), but probing into WHY the behave, think or prefer?

- **Sensory –** What do people see, hear, smell or consider when evaluating a product?
- **Changes over time –** How do you think your use or preferences are changing?

Bias Concerns (1)

- Interviewer and/or moderator bias
  - Body language
  - Gender
  - Age
  - Race
  - Power (what is the role of the person doing the interview)

Bias Concerns (2)

- Biased questionnaire, Biased answers, biased samples, biased reporting
- Example of Biased Question (leading question):
  1. “As you know food safety is a major issue for vegetable consumers in Myanmar”
  2. “Some people think vegetables from China are high in pesticides and unsafe.”

- Better:
  1. “Are their any concerns are issues you are aware of with respect to vegetable purchases or consumptions?”
  2. “What is your opinion of vegetables from the following countries… ?”

Bias Concerns (3)

- Biased answers
  - Due to: dominant respondent, question order, sensitive issue, social acceptance, sponsor bias
- biased samples,
- biased reporting

Methods of Qualitative Consumer Research - Observation

1. Observation (shadowing)
   - Point of sale /purchase – e.g. in the market place while shopping or in a restaurant
   - Point of usage – e.g. home while cooking
   - Note behaviour
   - Deduce reasons for behaviour

2. In-depth Interviews

- End-consumer and/or expert, key informants (e.g. retailer, chef)
- 15-45 minute interview
- Unstructured, semi-structured, structured?
- Open-ended
- Number of respondents???
- **Ethnographic Interview/Contextual Inquiry**

3. Focus Group Discussions

- 6-12 participants (end-consumers and/or experts retailer)
- Trained Moderator /faciliator
- Interview instrument – discussion guide
- Focused around 5-6 questions
- Participants should be similar in terms of socio-demographics
- Stop when learning no new information

Sensory research

- Increasingly we're investing in research to "enhance" food product quality in hopes of increasing value…
  - New varieties (pest and disease resistant, climate suited)
  - Perishability, storage life
  - Labels (credence information such as "organic")
- BUT, what if what if that product changes the sensory attributes
- May be able to sell the product once, but what about twice?
- Important to understand all quality cues consumers use
- Must understand the impact of product "improvements" on sensory or organoleptic attributes

Organoleptic analysis?

- "…of or pertaining to the sensory properties of a particular food or chemical."
- Typical sensory properties of a food product
  - Taste (sweet, sour, bitter, flavour)
  - Appearance
  - Color
  - Smell / Aroma
  - Size
  - Firmness
  - Sound (e.g., the "snap" or "crack" when biting an apple)
  - Mouth feel (tenderness, juiciness)
  - Any other sensations related to eating a food???

Sensory information matters…

Sensory Research Summary

- Understanding the quality attributes important to consumers is important for value chain development
  - Ultimately extrinsic attributes will sell a product once, but organoleptic quality is also important in growing demand
- Exposing producers to organoleptic information is also helpful
  - e.g. impact of production methods on quality
- Sensory research does not need to be difficult- you do not need “trained” panels
  - But, you do need products to test
  - Need methods to measure consumers’ perceptions of organoleptic quality

Qualitative Methods

DISCUSSION-

Which Method is Best?

Quantitative Methods

Secondary Data

- Macro-level data on a “market”
- Demand conditions
- Consumption and prices
- Attitudinal surveys to measure trends or changes in attitudes

Secondary Data Considerations

- Definitions of variables
  - Example: Do food expenditures include food-away-from home?
  - How is consumption calculated?
  - Family size or household size
- Measurement error
  - need to understand the sample
- Source bias
  - vested interests (ex. Government versus private sources)
- Reliability
  - changes in data collection methods over time
- Time scale
  - is it out of date?

Sample, Sampling, and Non-Response Bias

Primary Data: Sampling- Who to interview

- Sampling may be especially difficult in consumer research for development (R4D) context
- Sample frame is often the issue
  - List from which a sample is drawn from don't exist
  - We don't know characteristics of the "population"
- Convenience sample vs. representative

- What or who is your market or potential market?
  - Population (Census)
  - Urban or rural
  - Food shoppers or food decision makers?
    - Housewife or someone else (e.g. domestic assistant?)
  - Shoppers at a specific outlet type?
    - Modern (supermarkets) vs. traditional retail outlets
    - Food away from home (e.g. restaurants)
    - Resorts and tourists
    - International / Export markets

Some Definitions

- Survey population
  - Consists of all units to which one desires to generalize survey results
- Sample frame
  - The list from which a sample is to be drawn in order to represent the survey population
- The sample
  - Consists of all units of the population that are drawn for inclusion in the survey

Some Definitions

- Completed sample
  - Consists of all units that return completed questionnaires
- Coverage error
  - Results from every unit of the survey population not having a known, non-zero chance of being included in the sample
- Sampling error
  - Result of collecting data from only a subset, rather than all, of the member of the sample frame; related to the precision of estimates for entire population

Some Definitions

- Nonresponse error
  - Results when characteristics of responders differs from non-responders
- Measurement error
  - Individual survey questions were misunderstood or incorrectly answered

Goal of Survey Design

- Minimize four types of potential survey error
  - Coverage, sampling, nonresponse, and measurement
  - Most surveys have a certain amount of coverage error that cannot be quantified
  - Sampling error can be calculated for each variable based on number of respondents
  - Nonresponse error: increasing response rate alleviates this concern; in some cases there are ex-post methods of dealing with this error
  - Measurement error: can be minimized by writing good survey questions

Reducing Coverage Error

- Ask the following question about any potential sampling list
  - Does the list contain everyone in the survey population?
    - Historically telephone directories exceeded coverage rates of 90%, but w/ recently unlisted telephones have increased to about 25%; random-digit dialing can alleviate this concern
    - Other options: lists of registered voters: utilities lists; organizations membership lists; magazine subscribers lists

Reducing Coverage Error

- Ask the following question about any potential sampling list
  - Does the list include names of people who are not in the study population?
  - How is the list updated and maintained?
  - Are the same sample units included in the list more than once?
  - Does the list contain other information that can be used to improve the survey or determine nonresponse bias?

Sampling

- Once a sample frame (list) has been determined; how do you draw names from the list?
- Types of sampling methods
  - Simple random sample
    - Each individual in sampling frame has an equal likelihood of being selected
  - Stratified random sample
    - The sampling frame is divided into G groups based on any personal characteristic; a random sample is taken within each sub-sample or strata
  - Convenience sample
    - Some samples have a greater chance of being selected than others; not representative; invalid to compute probability of sampling error
  - Quota sample
    - Like stratified sampling except strata membership is not known a priori; e.g., sample till X number of females are recruited

Example: Indonesian Consumer Study, Stratified multi-stage random sample

- 1180 urban consumers in 3 cities (Surabaya, Bogor, Surakarta)
- Interviewed by trained enumerators
- October – December 2010

1. Select cities within Java (based on population and size),
   - Surabaya – largest (2.8M)
   - Bogor – medium (950K)
   - Surakarta – smallest (499K)
2. Select kelurahan within each selected city by proximity to modern food retail stores by using map
3. Randomly select Kelurahan
4. For each selected Kelurahan, rank RWs and RTs based on "rough income estimation"
5. Randomly select 2 RT for each selected Kelurahan (oversample the high-income RT)
6. List all the HH at each selected RT
7. Randomly select households

Keys to developing survey questions to obtain unbiased data (reducing measurement error)

Quantitative questions

- Use or behavior
  - Frequency of use
  - Quantity
  - Expenditures (total and relative)
  - How do you use product
    - What products are used for what purpose
  - Where do you buy
    - Why do you buy it there
- Awareness, understanding or knowledge
- Perceptions
- Attitudes
- Importance

Preferences and Behavior

Q1 What type of meat do you most prefer to purchase for meals prepared and consumed *at home* (select only one)?

1 ☐ Beef	2 ☐ Chicken	3 ☐ Pork
5 ☐ Fish	6 ☐ Other Seafood	7 ☐ Other, please explain:

Q2 What is your most preferred meat for meals eaten *outside of the home*? (select only one)

1 ☐ Beef	2 ☐ Chicken	3 ☐ Pork
5 ☐ Fish	6 ☐ Other Seafood	7 ☐ Other, please explain:

Q3 How frequently do you purchase *beef* for meals in your household? (select only one)

0 ☐ Less than 1 time per month	1 ☐ less than 1 time per week to a few times monthly	2 ☐ 1-2 times per week	3 ☐ 3-4 times per week
4 ☐ 4 – 5 times per week	5 ☐ 6-7 times per week	6 ☐ more than 7 times per week	7 ☐ Other, please explain:

Q4 How frequently do you purchase and consume *beef outside of the home*? (select only one)

0 ☐ Less than 1 time per month	1 ☐ less than 1 time per week	2 ☐ 1-2 times per week	3 ☐ 3-4 times per week
4 ☐ 4 – 5 times per week	5 ☐ 6-7 times per week	6 ☐ more than 7 times per week	7 ☐ Other, please explain:

Q5 In total how much do you typically spend on food-related groceries in a week?_____(won per week)

Q6 In total how much do you typically spend on beef in a week?_____(won per week)

Q7 What is the average size of your typical beef purchase?

1 ☐ less than 100 grams	2 ☐ 100 grams to 500 grams	3 ☐ greater than 500 grams to less than 1 kg	4 ☐ 1 kg to less than 1.5 kg
5 ☐ 1.5 kg to less than 2 kg	6 ☐ 2 kg or more		

Measuring Importance or Relative Importance

- Rating
  - Please *rate* using the following scale
    - 5 point
    - 7 point
    - 21 point
- Ranking
  - Please rank the X most important attributes
    - Most important
    - 3-5 most important

Example of Rating: Important attributes for chocolate
(Vanuatu, share of respondents indicating level of importance)

C3. When purchasing chocolate for personal consumption or as a gift, how important are the following attributes:	Not at all Important (%)	A little important (%)	Somewhat Important (%)	Important (%)	Extremely Important (%)
Price	8	10	19	28	34
Flavour	1	2	6	28	63
Size or weight of the product	14	9	23	34	20
Packaging of the product	12	10	18	38	22
Nutritional information	19	9	15	30	27
High % dark chocolate/ high % cocoa	12	10	15	42	21
Milk chocolate rather than dark chocolate	15	9	18	35	23
Brand (e.g. Nestle, Cadbury, Hersheys etc.)	15	10	15	31	28
Certified Organic	19	10	15	31	24
Certified Fair Trade	20	10	16	34	20
Other certification (Rainforest Alliance, Utz, etc)	27	12	24	26	12
Ingredients are from a certain country (e.g. Vanuatu)	16	8	19	36	22
Ingredients are all from a certain part of a country	20	11	20	33	16
Product is produced locally	11	7	15	33	34
The product is produced locally and owned locally	11	6	12	33	38
Buying it helps support local producers	9	4	13	35	39
Produced using traditional methods or knowledge	15	6	19	37	24

Example of Ranking:
Important attributes for chocolate (Vanuatu, version 2)

CH2. When purchasing chocolate for personal consumption or as a gift, how important are the following attributes: Please rank your top 5 attributes '1' being the most important.

- ☐ A. Price
- ☐ B. Flavour
- ☐ C. Size or weight of the product
- ☐ D. Packaging of the product
- ☐ E. Nutritional information
- ☐ F. High % dark chocolate/ high % of cocoa
- ☐ G. Milk chocolate rather than dark chocolate
- ☐ H. Brand (e.g. Nestle, Cadbury, Hersheys, etc)
- ☐ I. Certified Organic
- ☐ J. Certified Fair Trade
- ☐ K. Other Certification (Rainforest Alliance, Utz, etc)
- ☐ L. Ingredients are from a certain country (e.g. Vanuatu)
- ☐ M. Ingredients are all from a certain part of a country (e.g. a particular island, region)
- ☐ N. Product is produced locally
- ☐ O. The product is produced locally and owned locally
- ☐ P. The product specifies that buying it helps support local producers
- ☐ Q. The product specifies it is produced using traditional methods or knowledge
- ☐ R. Other (please specify): …….

Rating- importance of characteristics

On a scale of 1 to 5, how important is each of the following characteristics when deciding where you will purchase food? (USE PINK CARD)

1 = Not at all important; 2 = Somewhat important; 3 = Moderately important; 4 = Important; 5 = Extremely important

		Importance				Importance	
C 13	Low prices (good value)		C 13	C 24	Can purchase small amounts		C 24
C 14	Fixed price (no negotiation)		C 14	C 25	Product is unpackaged (can see and feel)		C 25
C 15	Flexible prices (able to negotiate)		C 15	C 26	Store is easy to get to		C 26
C 16	Store provides discount (sales)		C 16	C 27	Store is close to other non-food shopping		C 27
C 17	Ability to purchase on credit		C 17	C 28	Store is close to entertainment & social opp		C 28
C 18	High-quality food products		C 18	C 29	Fast service (no waiting in lines)		C 29
C 19	Food is safe to eat		C 19	C 30	Cleanliness (including environment) of store		C 30
C 20	Food products are fresh		C 20	C 31	Better opening hours		C 31
C 21	Food product information (weight, labels, expiry, etc)		C 21	C 32	Air-conditioning		C 32
C 22	Product display is good (easy to find products)		C 22	C 33	Friendly staff		C 33
C 23	Wide variety of food products (good selection)		C 23	C 34	Delivery Service		C 34

Back of D.

Codes for D7 and D8

Note: Ask respondent questions without prompting answers. Then code using table below.

1	Low price (good value)
2	Fixed price (no negotiation)
3	Flexible prices (able to negotiate)
4	Store provides discount (sales)
5	Ability to purchase on credit
6	High-quality food products
7	Food is safe to eat
8	Food products are fresh
9	Food product information (weight, labels, expiry, etc)
10	Product display is good (easy to find products)
11	Wide variety of food products (good selection)
12	Can purchase small amounts
13	Product is unpackaged (can see and feel)
14	Store is easy to get to
15	Store is close to other non-food shopping
16	Store is close to entertainment & social opp.
17	Fast service (no waiting in lines)
18	Cleanliness of store (including good shopping environment)
19	Better opening hours
20	Air-conditioning
21	Friendly staff
22	Delivery service

Example of Ranking: Factors in Indonesian's Food Choices

H. FACTORS IN FOOD CHOICE

In choosing the food products you purchase, what are the 3 most important factors influencing your decision (apart from halal)?

	Most important H1	2nd most H2	3rd most H3
1. Food in general			

In choosing each of the following types of products, what are the 3 most important factors influencing your decision (apart from halal)?

	Most H1	2nd Most H2	3rd Most H3
2. Mango			
3. Other Fresh Fruit			
4. Chilli			
5. Shallot			
6. Other Fresh Vegetables			
7. Shrimp			
8. Poultry			
9. Meat (beef, lamb etc)			

Codes for H1 - H3			
1	Price	12	Diversity
2	Nutritional content	13	Smell
3	Food safety	14	Colour
4	Quality	15	Appearance
5	Taste	16	Firmness/texture
6	Freshness	17	Variety (e.g. gadung)
7	Easy to prepare	18	Package size
8	Production method (e.g. organic)	19	Expiry date
9	Brand	20	Other labelling info
10	Origin (country or region)	21	Never purchase this item
11	Grade, Class, Size		

Food	Poultry	Chili	Mangos
Price	Freshness	Freshness	Taste
Quality	Price	Quality	Freshness
Freshness	Quality	Price	Price
Safety	Colour	Colour	Quality
Taste	Texture	Appearance	Smell

Example of best-worst question.

Which of the following issues is most important and which is least important when you purchase food? ***(check only one issue as the most important and one as the least important)***

Most Important		Least Important
☐	Taste (extent to which consumption of the food is appealing to the senses)	☐
☐	Price (the price that is paid for the food)	☐
☐	Safety (extent to which consumption of food will not cause illness)	☐
☐	Convenience (ease with which food is cooked and/or consumed)	☐
☐	Nutrition (amount and type of fat, protein, vitamins, etc.)	☐
☐	Environmental Impact (effect of food production on the environment)	☐

Lusk J L , and Briggeman B C Am. J. Agr. Econ. 2009;91:184-196

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Shopping behaviour

G. RETAIL OUTLET USE, PREFERENCES QUALITY, SAFETY AND CONVENIENCE

		If G1 = 1-8 then Ask				
	Where do you usually buy [food type]?	What is the primary reason that you buy [food type] at this outlet?	Which is the best type of outlet to buy [food type] at a good price?	Which is the best type of outlet to buy [food type] that is quality?	Which is the best type of outlet to buy [food type] that is safe to eat?	Which is the best type of outlet to buy [food type] where you trust the product information?
	1. Hypermarkets 2. Supermarkets 3. Minimarkets 4. Semi-perm. stand 5. Small shop (warung) 6. Traditional wet market 7. Peddlers 8. From producer 9. Never buy	Please use codes below.	1. Hypermarkets 2. Supermarkets 3. Minimarkets 4. Semi-perm. stand 5. Small shop (warung) 6. Traditional wet market 7. Peddlers 8. From producer	1. Hypermarkets 2. Supermarkets 3. Minimarkets 4. Semi-perm. stand 5. Small shop (warung) 6. Traditional wet market 7. Peddlers 8. From producer	1. Hypermarkets 2. Supermarkets 3. Minimarkets 4. Semi-perm. stand 5. Small shop (warung) 6. Traditional wet market 7. Peddlers 8. From producer	1. Hypermarkets 2. Supermarkets 3. Minimarkets 4. Semi-perm stand 5. Small shop (warung) 6. Traditional wet market 7. Peddlers 8. From producer
Food product catgories	G1	G2	G3	G4	G5	G6
1 Fresh meat, poultry meat and offal						
2 Fresh fish and seafood, e.g. shrimp						
3 Fresh fruits						
4 Fresh vegetables						
5 Fresh milk and yogurt						
6 Processed food items (e.g. boxed goods)						
7 Rice						

Codes for G2

1 Low price (good value)
2 Fixed price (no negotiation)
3 Flexible prices (able to negotiate)
4 Store provides discount (sales)
5 Ability to purchase on credit
6 High-quality food products
7 Food is safe to eat
8 Food products are fresh
9 Food product information (weight, labels, expiry, etc)
10 Product display is good (easy to find products)
11 Wide variety of food products (good selection)
12 Can purchase small amounts
13 Product is unpackaged (can see and feel)
14 Store is easy to get to
15 Store is close to other non-food shopping
16 Store is close to entertainment & social opp.
17 Fast service (no waiting in lines)
18 Cleanliness of store (including good shopping environment)
19 Better opening hours
20 Air-conditioning
21 Friendly staff
22 Delivery service

Awareness, Purchases Behaviour

J1. CERTIFICATION AWARENESS, PURCHASES, PERCEPTIONS

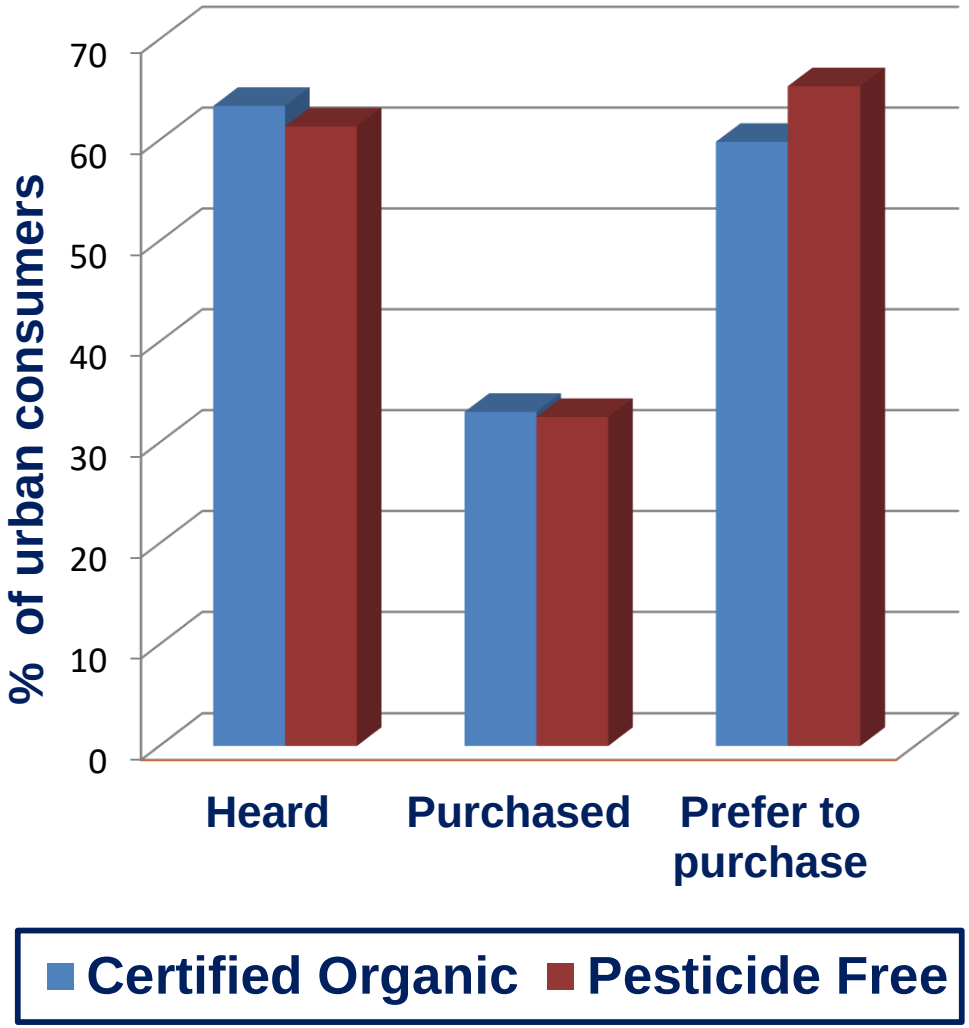
	NOTE: ALL CELLS IN THIS TABLE SHOULD BE FILLED OUT!	Have you ever seen or heard of food products that are sold …. 1 = Yes ; 2 = No	Have you ever PURCHASED food and beverages that are sold as … 1 = Yes ; 2 = No; 3 = Do not know, unsure	Would you PREFER to purchase food and beverages that are sold as … 1 = Yes ; 2 = No 3 = Unsure, do not understand
		J1	J2	J3
1	…organic or certified organic?			
2	…pesticide free?			
3	…chemical free?			
4	…natural?			
5	…preservative or additive free?			
6	…natural ripening?			
7	…safe or safety guaranteed?			
8	…healthy?			
9	…environmentally friendly or eco-friendly?			
10	…hydroponic?			
11	…hygienic?			
12	…from a particular country?			
13	…from a particular region of Indonesia?			
14	…free of genetically modified organisms (GMO Free)?			

Knowledge and Perceptions

	J4	J5
	…organic? 1. Yes; 2. No	pesticide free? 1. Yes; 2. No
1 Do you know what it means when a product is labelled or certified as ….		

Do you agree with the following statements. [Complete each column in this section ONLY if the answer in row 1 above = yes. Otherwise leave column blank]		Certified "organic" products … 1 = Yes or 2 = No	Certified "pesticide Free" products … 1 = Yes or 2 = No
2	…are healthier.		
3	…contain no pesticides or residues.		
4	…were produced without pesticides.		
5	…were produced without GMOs.		
6	…are more eco-friendly or environmentally friendly.		
7	…production is overseen by government		
8	…are safer to eat.		
9	…are better tasting.		
10	…are no different (certification is meaningless).		

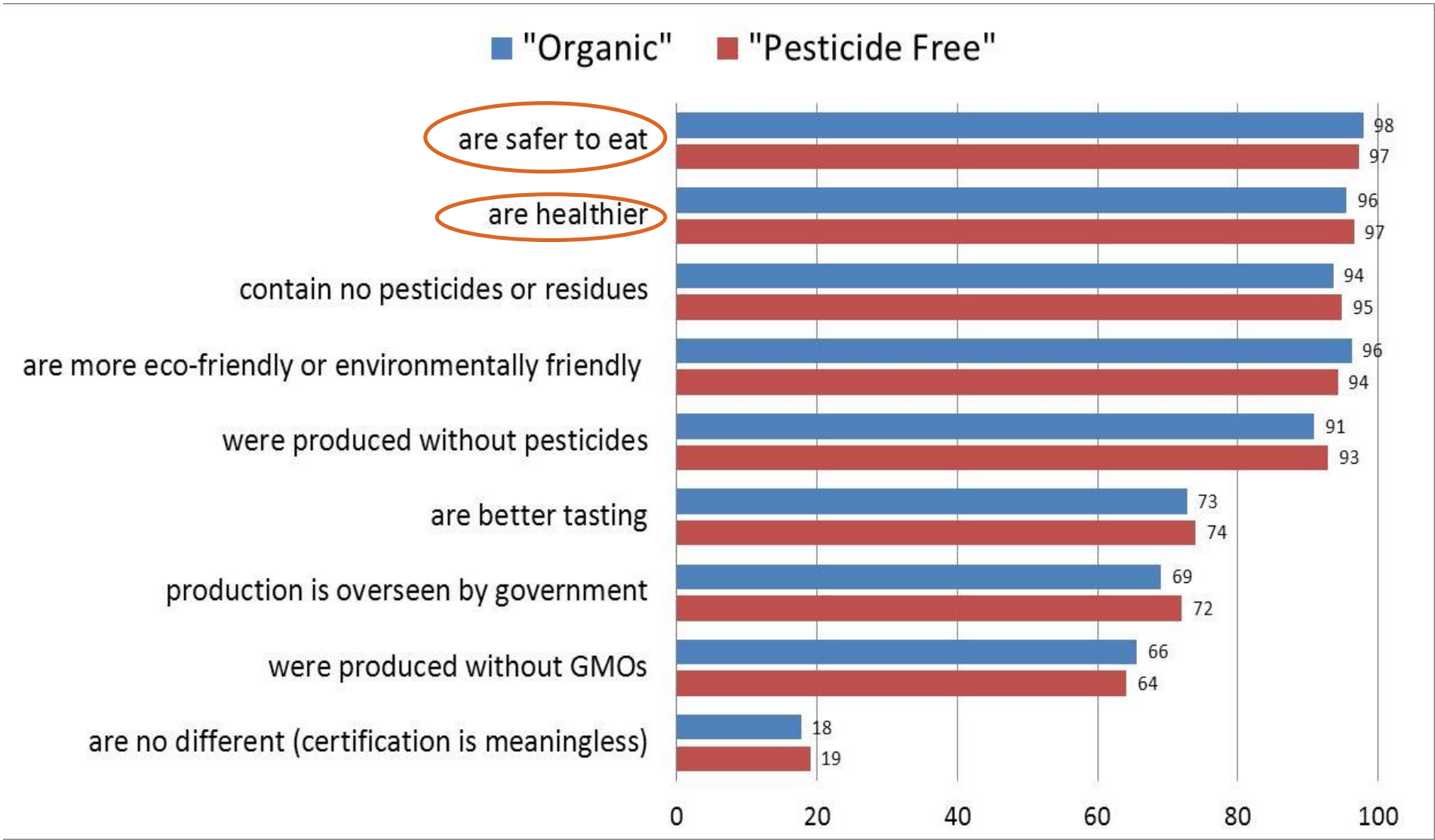
Consumers' Awareness, Purchases and Perceptions of Credence Attributes on Fresh Food Products



- 61-63% “aware” of organic & pesticide-free
- 33% previously purchased organic & pesticide-free
- 60-65% would prefer to purchase food products labelled as ‘certified organic’ or ‘pesticide free’

Urban Consumers' Perceptions of Certified "Organic" and "Pesticide Free"

% of respondents who agreed that Certified Organic or Pesticide Free is…



Willingness-to-pay (WTP)

- Willingness to pay for a specific attribute or set of attributes
- Relative value of different attributes
- Market segmentation
  - Segment that offers best opportunity
- Effect of information on WTP

WTP Methods

- Contingent valuation methods
  - Maximum willingness to pay (choice)
  - Payment card
  - Open-ended
- Conjoint analysis
  - Discrete choice experiments
  - Best-worst scaling
- Experiments
  - Natural or field experiments
  - Laboratory experiments

Issues with WTP

- WTP estimates vary depending on the methodology
- Stated Preferences (SP) versus Revealed Preferences (RP)
- Hypothetical (SP) vs. Non-hypothetical (RP)
- Stated Preferences
  - Contingent Valuation (payment card, dichotomous choice)
  - Conjoint Analysis
  - Discrete Choice Experiments (# of attributes presented...)
- Revealed Preferences
  - Experimental Auctions (Vickrey or BDM auction)
  - *Simulate* market scenarios –

Payment Card

14. Please imagine that you are at the counter where you usually buy beef. Two cuts of beef are available one is regularly and the other is naturally produced. There are also two precooked entrées available. The naturally produced meat is from animals born and raised within 200 miles of where you live. The meats are displayed identically; their color, fat, and size are exactly the same. The entrées are also displayed identically; the ingredients and portion sizes are exactly the same.

a.) Considering the prices indicated for the regular beef cuts and regular beef entrées, what cost would be reasonable to pay for the natural and regionally produced? (X ONE Box for EACH type of product)

b.) Then on the same scale, indicate the maximum price you would pay for the products labeled natural and regionally produced? (X ONE Box for EACH type of product)

c.) "X" the appropriate box, if you do not buy the product, or would not pay any amount above the regular beef price.

EXAMPLE	****EXAMPLE ONLY****Beef Roast – Regularly costs $2.81/lb.****EXAMPLE ONLY****										
Cost Per Lb. ⟶	$2.81	$2.95	$3.10	$3.25	$3.42	$3.59	$3.77	$3.95	$4.15	$4.36	$4.59
a.) Reasonable to pay	1☐	2☐	3☐	4☐	5**X**	6☐	7☐	8☐	9☐	10☐	11☐
b.) Max you would pay	1☐	2☐	3☐	4☐	5☐	6☐	7☐	8**X**	9☐	10☐	11☐
This shopper feels that $3.42 would be a reasonable price to pay, but the maximum amount the shopper would pay is $3.95.											

14a.	**80% NATURAL LEAN GROUND BEEF – Regular Beef costs $2.29/lb.**										
Cost Per Lb. ⟶	$2.29	$2.51	$2.77	$3.05	$3.35	$3.69	$4.05	$4.46	$4.91	$5.40	$5.93
a.) Reasonable to pay	1☐	2☐	3☐	4☐	5☐	6☐	7☐	8☐	9☐	10☐	11☐
b.) Max you would pay	1☐	2☐	3☐	4☐	5☐	6☐	7☐	8☐	9☐	10☐	11☐
☐ "X" this box if you do not buy 80% ground beef											
☐ "X" this box if you are NOT willing to pay ANY amount above the regular cost											

*** 17. Considering the price of $20.95 for the "unspecified/regular" steak, what would be the maximum amount you would be willing to pay for the "Locally Raised" steak?**

	I would pay this amount
$20.95	◯
$23.05	◯
$25.15	◯
$27.25	◯
$29.35	◯
$31.45	◯
$33.55	◯
$35.65	◯
$37.65	◯
$39.80	◯
$41.90	◯
I would NOT purchase a "Locally Raised" steak	◯
I would only buy a "Locally Raised" steak if it was priced LESS than the regular and the "Nebraska Source Verified" steak	◯

Example: Contingent Valuation WTP for Certified Organic

		Does your household ever purchase [product]?	**If J12 = yes**		**If J12 =yes and J14=2**
			What is the normal price you pay for this product?	If you have a choice between buying conventional [product] and [product] that is labeled "Certified Organic", which one would you buy? 1 = I would NEVER buy the "Certified Organic" product 2 = I would buy the "Certified Organic" product if the price was right.	What is the maximum amount extra that you would be willing to pay for [product] that is labeled as "Certified organic"?
		1. Yes 2. No	Rupiah/kg		(percent)
J11	Product	J12	J13	J14	J15
1	Chillies				%
2	Mangos				%
3	Shrimp				%
4	Chicken				%

Stated Willingness-to-Pay for "Certified Organic" Food Products

- 67% - 69% willing to buy certified organic if price was "right"
- On Average, Indonesian urban consumers were willing to pay a price premium of 20% for certified organic products
- Not significant differences in premiums across product categories

Products	% Regularly Purchase [product]	Normal Price (Rp/kg)	% willing to buy "certified organic" if the price was right	Average Willingness to Pay (% extra from normal price)
Chilli	98.5%	24,900	67.8%	19.6%
Mango	94.4%	7,500	67.2%	21.8%
Chicken	96.3%	24,300	67.4%	18.4%
Shrimp	75.9%	35,500	69.5%	19.4%

Stated Preference (SP) Methods

- Direct Methods
  - Rating scales
  - Ranking
  - Attitudinal measures
  - Contingent Valuation (CV)
    - Open ended, payment card, dichotomous choice
- Issues with SP methods
  - Hypothetical
  - Overstate the importance of product characteristics
  - Stated importance and attitudes weakly related to actual purchase behaviour

Indirect preference measures

- Conjoint analysis
  - Respondents rank, rate, or choose between competing product profiles that differ in terms of a number of attributes

- Discrete Choice Experiments (DCEs)
  - Choice sets framed to closely resemble purchasing scenarios
  - Consumers choose from a set of products, each with different attributes
  - Holistic product evaluation
  - Forces respondents to trade-off several attributes against another
  - Consistent with random utility theory
  - Evidence that DCEs allow researchers to efficiently:
    - estimate relative values for multiple product attributes
    - predict consumers' actual market behavior

Example of Discrete Choice Experiment:

Relative WTP for COOL, Traceability, Food Safety and Tenderness

20.1	Option A	Option B	Option C
Price	6.75	9.45	Neither Option A nor B Is Preferred
Country of Origin Labeled	No	Yes	
Traceable to the Farm	Yes	No	
Food Safety Inspected	No	Yes	
Guaranteed Tender	No	Yes	
I would choose: (Please Mark Only One Box) →	☐	☐	☐

Attribute	Mean WTP
COOL	$2.57/lb
Traceable	$1.90/lb
Food Safety	$8.07/lb
Tenderness	$0.95/lb

Loureiro, M.L. and W.J. Umberger. 2007. "A Choice Experiment Model for Beef: What US Consumer Responses Tell Us About Relative Preferences for Food Safety, Country-of-Origin Labeling and Traceability." *Food Policy*. 32(4):496-514.

2009 Australian Beef DCE Study: Relative Importance of COOL

Umberger, W.J. and S.C. Mueller. 2010. "Is Presentation Everything? Using Visual Presentation of Attributes in Discrete Choice Experiments to Measure the Relative Importance of Intrinsic and Extrinsic Beef Attributes." Selected Paper for the 2010 American Agricultural Economics Association Meetings. Denver, USA.

	Price	Brand	Quality Certification	Production Claim	Forage Claim	Health Claim	Marbling	Fat Trim
Levels	8	8	8	8	4	4	4	4
Level 1	$15.99	Woolworths	Australian Quality (Aus Qual)	Environmentally Sustainable	Grass-Fed	Heart Tick	Void (0)	Devoid (2 mm)
Level 2	$19.99	Coles	Meat Standard Australia (MSA)	100% Hormone & Antibiotic Free	Grain-Fed	None	Level 2	5mm
Level 3	$23.99	Terra Rossa	Eating Quality Assured (EQA)	Certified Humane	None	None	Level 4	10 mm
Level 4	$27.99	King Island	Australian Beef	None	None	None	Level 6	20 mm
Level 5	$31.99	Coorong Angus Beef	None	None				
Level 6	$35.99	1824	None	None				
Level 7	$39.99	Dalriada Diamond	None	None				
Level 8	$43.99	Certified Australian Angus Beef (CAAB)	None	None				

Imagine you are shopping for a Sirloin/Porterhouse beef steak at your favourite retail outlet for consumption at a dinner with family and/or friends on the weekend.

In the following screens you will be shown 16 shelves with four different meat cases each.

In addition to variations in price, marbling, and external fat, each steak will vary in product such as brand and certifications - these are similar to the ones that you've just evaluated.

This is an example:

Would you realistically purchase the option you chose?
Please select one

- (•) Yes
- ( ) No

Select the beef steak you would be most likely to choose. Please indicate your choice by clicking on the steak that is your most preferred alternative, it will be highlighted with a RED frame.

Finally, please indicate if you realistically would purchase your most preferred alternative.

You will be forwarded to the next shelf answering these questions and clicking the ">>" button.

Your progress through the 16 different shelves will be indicated in the lower right hand side of the screen.

Aggregate Importance

Aggregated attribute importance weightings [i]

Attribute	Importance
Marbling	46.3%
Price	34.7%
Fat Trim	10.6%
Health Claim	0.5%
Brand	0.5%
Production Claim	0.2%
Quality Certification	0.2%
Forage Claim	0.1%

[i] Weighted average of class wise importance measured by partial contribution to model fit – LL

- Country of Origin is included as a Quality Certification
- Less than 1% of importance

Take Home Messages

- There is not a “one size fits all” research method, the “best” depends what you’re trying to do and how accurate you need the information to be
  - Developing the marketing mix for a new product
  - Predicting demand for a new product
  - Determining where or how to intervene in a chain
- Indirect methods (e.g. conjoint methods, preferably discrete choice experiments) are essential for determining relative value and predicting demand
- Never, ever assume
- Engage a behavioural economist or marketing specialist

Thank you! Questions?

http://www.adelaide.edu.au/global-food
http://www.adelaide.edu.au/global-food/blog/wendy.umberger@adelaide.edu.au

Extra slides regarding sampling for your information only

Sampling

- Example regarding market segments: A properly executed simple random sample will capture market segments in the approximate proportion in which they exist in the sampling frame
- In a stratified sample, the sample taken from each group need not result in same sample proportions as the population; however, strata can be weighted to achieve represenativeness

Sampling

- Why would you ever want a stratified sample?
  - If you want sufficient data on small portions of the population (e.g., a very small market segment)
  - If you desire greater reliability (and larger sample) for some strata than others
  - If there is little population variance within strata and large variance between strata (can significantly reduce sample size requirements)

Sample Size for Random Sample

- How large should your sample be?
- Assume interested in responses to a single *dichotomous variable (proportion)* and that you're interested in estimating the distribution of some characteristic in the population
- It depends on . . .
  - P: proportion of the population expected to choose the response category
  - A: sampling error (e.g., .05 = +/- 5% of the true population value)
  - N: size of the population
  - S: minimum sample size needed for desired level of precision
  - α:confidence level: (e.g., 0.95 means 95% sure estimated proportion is with A% of true proportion
  - Z: the z-statistics associated with confidence level α (e.g., Z=1.96 for α=0.95)

Sample Size for Random Sample

$$S = \frac{N*(P)*(1-P)}{(N-1)*(A/Z)^2+P(1-P)}$$

Sample Size for Random Sample

Sample size requirements for 95% confidence level

	10% sampling error		5% sampling error	
Population Size	P=0.5	P=0.8	P=0.5	P=0.8
100	49	38	80	71
1,000	88	58	278	198
10,000	95	61	370	240
1,000,000	96	61	384	246

Sample Size for Random Sample

Sample size requirements for 95% confidence level

	3% sampling error	
Population Size	P=0.5	P=0.8
100	92	87
1,000	517	406
10,000	965	640
1,000,000	1066	683

Sample Size for Random Sample

- How large should your sample be?
- Assume interested in the mean of a *continuous variable* and that you're interested in estimating the distribution of some characteristic in the population
- It depends on . . .
  - σ: expected standard deviation of mean
  - A: desired level of precision (in units of mean) (e.g., 1.5 = +/- 1.5 of the true mean)
  - Z: the z-statistics associated with confidence level (e.g., Z=1.96 for α=0.95)
  - S: minimum sample size needed for desired level of precision

Sample Size for Random Sample

$$S = (Z^2 * \sigma^2)/A^2$$

The calculation above will *underestimate* the required sample; use a correction table. Plug the value S into a "correction table" – e.g., see Kupper, L.L. and K.B. Hafner. 1989. How appropriate are popular sample size formulas? The American Statistician (43):101-105.; this calculation also assumes large population – for smaller populations another correction is needed

Example: suppose interested in mean age, with $\sigma=10$ and $A=2$ & $Z=1.96$. $S=96.04$; correction table indicates required sample size=116

Sample Size for Random Sample

- How large should your sample be?
- Assume interested in determining the necessary sample size for detecting differences between two means (e.g., treatment effects).
  It depends on . . .
  - expected standard deviations of means
  - minimum detectible difference
  - acceptable type I & type II errors
  - choosing samples based on the power (chance of type II error) of the test
  - required sample size typically much lower than that needed to estimate distribution of a statistic in the population

Sample Size

- Several web sites have calculators:
  - http://www.chartwellsystems.com/sscalc.htm
    - Has simple on-line calculator
  - http://www.aboriginemundi.com/ssc/
    - Has a program you can download for all kinds of sample size calculations

Sample Selection Bias – NonResponse Error

- One (imperfect) way to deal with nonresponse error is to create a weighting scheme
- There a numerous, complicated weighing methods
- Consider a simple example

Weighting

- Suppose you conducted a survey where there were 10 respondents, who stated their WTP for a policy and who stated their income (1=greater than $43,381;0=less than $43,381)

Weighting

Subject	WTP ($/year)	Income
1	9	0
2	32	0
3	19	0
4	50	1
5	60	1
6	39	0
7	4	0
8	10	0
9	36	0
10	83	1
AVE	**34.2**	**0.3**

Weighting

- According to the US census, the median household income in the US in 2003 was $43,381(lets say it was also the average for convenience)
- So, 50% of the population has income greater than $43,381 and 50% have less
- HOWEVER, in our sample of 10 individuals, only 30% have incomes greater than $43,381

Weighting

- To make our sample “act” like the US population in terms of income, people with high incomes need to count more (given more weight) and people with lower incomes need to count less (given less weight)
- A simple weight for high income = 0.5/0.3 = 1.6667
- A simple weight for low income = 0.5/0.7=0.7143

Weighting

- Now, instead of taking the average where everyone gets the weight of 1, conduct a weighted average
- Weighted average: weight*X/N

Weighting

Subject	WTP	Income	Weight	WTP*Weight	Income*Weight
1	9	0	0.7142	6.4281	0
2	32	0	0.7142	22.8556	0
3	19	0	0.7142	13.5705	0
4	50	1	1.6667	83.3335	1.67
5	60	1	1.6667	100.0002	1.67
6	39	0	0.7142	27.8553	0
7	4	0	0.7142	2.8570	0
8	10	0	0.7142	7.1424	0
9	36	0	0.7142	25.7126	0
10	83	1	1.6667	138.3336	1.67
AVE	**34.2**	**0.3**	**Wt. AVE**	**42.81**	**0.50**

Weighting

- Now our sample average income equals our population average
- Effect of weighting on WTP?
  - WTP of higher income people was higher than WTP of lower income people
  - There were fewer high income people in the sample
  - Thus, weighted average WTP is *greater* than the simple unadjusted average

NonResponse Error

- Another way to deal with nonresponse error is to use methods outlined in literature on sample selection
- See many papers by Heckman – beginning with *Econometrica*, 1979
- Requires data on some characteristics of all individuals sampled (e.g., income, education, etc.) prior to the survey

Correction for Sample Selection

- Step 1: Estimate the probability an individual responds to the survey using a probit model (1=responds; 0=non-response) as a function of available characteristics, X1
- Step 2: Use the probit estimates to calculate the "inverse mills ratio" $\lambda=\phi(\beta*X1)/\Phi(-\beta*X1)$ for each respondent, where ϕ and Φ are standard normal pdf and cdf and β are probit estimates
- Step 3: Include λ as a regressor in the OLS regression you're interested in on the subsample of respondents (resulting coefficients are consistent, but standard errors need some adjusting)

Sample Selection

- A number of studies suggest that the assumption of bi-variate normality may cause poor inferences in models of sample selection
- There are now available a number of non-parametric techniques to deal with sample selection