



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10**

1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
WATER AND WATERSHEDS

November 20, 2013

Don Essig
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, Idaho 83706

RE: EPA comments on Idaho's revised draft fish consumption survey questionnaire and Boise State University's Draft Final Report

Dear Don:

EPA appreciates the opportunity to provide comments on the materials Idaho Department of Environmental Quality (DEQ) provided at the October 15, 2012 negotiated rulemaking meeting. As you know, as a result of the government shutdown, EPA was unable to attend the meeting. However, we appreciated hearing your summary of the meeting and have reviewed the meeting materials that are posted on DEQ's website.

At this time, we are providing comments on DEQ's revised draft fish consumption survey questionnaire and the Boise State University report entitled, "Idaho Fish Consumption Rate Recommended Sample and Questions," October 30, 2013. Our detailed comments are provided in the attachments and include input from both EPA Region 10 and EPA Headquarters. Although EPA attempted to integrate comments, EPA felt that getting comments to DEQ quickly was a higher priority than integrating all comments received. Consequently, two sets of EPA comments are being provided to you as attachments. We are still reviewing DEQ's discussion paper developed on consumers versus non-consumers and will provide comments in a subsequent letter.

As we've discussed, EPA is providing comments to help ensure that DEQ conducts a quality fish consumption survey to support revisions to Idaho's human health criteria for toxic pollutants. To achieve this outcome, it is essential that Idaho provide the basis and rationale for their fish consumption survey instrument, as well as information required to implement the survey. Although DEQ addressed some of our comments on the previous version of the questionnaire, EPA believes that the questionnaire and supporting materials continue to require additional and important modifications.

It is our understanding that Idaho is interested in deriving general population and recreational angler fish consumption rates using the National Cancer Institute (NCI) method. Designing surveys to specifically implement the NCI method is a developing area, and it is important that the Idaho survey collect sufficient data to implement the NCI method properly. Specifically, it is important that the data set include a sufficient number of repeat interviews for individuals who have consumed fish on multiple occasions. If such data are not available, then the NCI method cannot be implemented. If that is the case, the current questionnaire design would only leave

DEQ with 24 hour recall results that would only be suitable for computing average fish consumption rates. It would not be possible to develop accurate upper percentile fish consumption rate estimates. DEQ may wish to consider the feasibility of an alternate food frequency questionnaire approach should implementation of the NCI method not be possible.

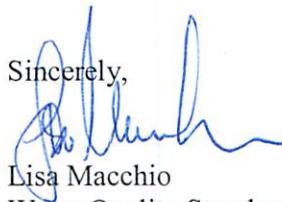
In reviewing DEQ's draft survey questionnaire and supporting documentation, EPA's focus continues to be on the accurate characterization of high fish consumers in Idaho. This information is critical to DEQ's efforts to consider what would be required to protect high fish consumers as well as the general population. EPA is concerned that general population fish consumption rate information, including upper percentile general population fish consumption rate estimates, may not adequately characterize high fish consumers in Idaho. Therefore, we believe the most important information needs for Idaho's human health criteria revisions are rates for recreational anglers and tribes residing within Idaho. To that end, EPA supports DEQ's efforts to conduct a recreational angler survey and to consider the results from EPA-funded Idaho tribal surveys.

We understand that DEQ plans to conduct the recreational angler survey concurrent with the general population survey as a means of characterizing high consumers in Idaho. It is currently unclear whether DEQ intends to use the general population questionnaire to survey recreational anglers. Therefore, EPA requests that DEQ clarify what data collection methods will be used for this group.

Finally, we understand that Idaho is waiting to make some key policy decisions later in its rulemaking process that will ultimately affect how to revise the human health criteria. Idaho should identify the data needs for each policy issue of concern. DEQ should then verify that the survey collects the needed information to support analysis of each policy issue. This approach will also insure that the survey does not collect extraneous information.

EPA understands that DEQ is in the process of addressing the comments received to date and we hope our comments are helpful as you make revisions. We are available if you would like to discuss our comments further, and we look forward to continued work with DEQ on this effort. Please contact Lon Kissinger (206-553-2115) or myself (206-553-1834) if you have any questions.

Sincerely,



Lisa Macchio
Water Quality Standards Coordinator

Enclosure

EPA Comments Attachment 1 - Survey Design Report for the Idaho Fish Consumption Survey

Introduction

It is important to recognize the hard work that has gone into the development of the survey design and instrument. While there are many good attributes of both, the following comments focus on ways to improve the survey.

Overall:

The report would benefit from a thorough discussion of both the sample frame to be used and a brief summary of the data collection plan.

In order to ensure that the target population is reached and the data collected will be useful, studies need to determine the specific research questions that the study will answer. The Idaho Fish Consumption Rate Study should include a focus on high consumers of local fish as well as the general population. If that is the case, it should be specified early and clearly within the document. A study design should be developed that assures overrepresentation of high consumer groups and uses a sampling frame that ensures representation of these groups. Depending on local conditions, high consumers might include tribal populations, various ethnic groups, economically disadvantaged, and anglers, for example. Oversampling of the populations of interest could be done by enhancing the sample through lists provided by relevant sources (e.g., tribal rosters) or through a screening process to ensure that high consumers are oversampled. Both approaches may increase the challenges of data analysis, but will ultimately allow the study to answer research questions about high consumers in addition to the GP.

Otherwise, major concerns are in regards to the:

- proposed method to collect nutritional data
- understanding of the NCI Method represented by the write-up
- basis of the proposed sample size
- mode of data collection.

These are discussed below, followed by specific comments and comments on the survey instrument.

Standard Nutritional Data Collection

The Boise State Fish Survey is intended to determine the frequency and quantity of local fish consumption among Idaho residents (anglers and non-anglers). A blended approach, combining elements of a 24-hour recall and a FFQ covering a one year time frame may allow reliable assessment of fish consumption, provided the two methods are carefully developed and applied. The proposed approach of collecting intake data for the past seven days is not a validated technique for yielding

accurate usual intake estimates. In brief, the proposed dietary assessment survey begins with a gate question to identify consumers; individuals who report that they did not eat fish in the last year were considered non-consumers and were not asked detailed consumption questions; fish consumers provided intake data over various timeframes (past day, and past week excluding past day). While obtaining consumption information for varying recall timeframes enables researchers to derive reliable estimates, the proposed methodology may create respondent bias and yield unreliable estimates. For example, question on type of fish, source, preparation method, and amount eaten are typically limited to the previous 24 hours or collected via prospective food dairies/records. In the proposed survey, consumers are asked such questions for the past seven days and this approach can result in inaccurate intake estimates. Additionally, fish intake may vary across seasons and intake in the past day or the past seven days is not representative of usual intake. Even among consumers, fish consumption is known to be episodic – high consumers may vary their intake (amount) with the seasons or for other reasons.

The selection of the dietary assessment method(s) for a research study should be driven by the research purpose, study design, and population of interest. Each dietary assessment method has strengths and limitations; for example 24-hour recalls allow researchers to obtain detailed information about the foods consumed, meal specific details, and timing of meals but represent intake over a 24-hour period. Similarly, FFQs enable researchers to obtain information on usual intakes but not about the meal specific details, timing of meals, etc. A thorough discussion of dietary assessment methods, their strengths and weaknesses, and settings under which they provide most useful information can be found in Thompson, F. E., and Subar, A. F. (2013). Chapter 1. Dietary assessment methodology. In “Nutrition in the Prevention and Treatment of Disease” (A. M. Coulston, C. J. Boushey, and M. G. Ferruzzi, Eds.). Elsevier: Amsterdam, p. 5-46.

NCI Method

On page 9 of the draft report, the authors discuss the NCI Method. The paragraph is a bit confusing. While it is correct that the NCI Method assumes that all respondents are consumers, this can easily be adjusted for by excluding never consumers from the analysis. Never consumers would need to be defined based on a survey question asking if the respondent ever consumes fish or gets at whatever the survey’s definition of fish consumer is (*e.g.*, never consumes fish from Idaho waters, never consumes any fish, never consumes more than incidental fish, etc.).

The draft report also states that the NCI Method “assumes that the in-person variation is greater day to day than the between-person variation.” This is an incorrect statement. The NCI Method estimates both the in-person variation and the between-person variation from the data, either one could be greater; they are measured directly from the data. The draft report also implies that the NCI Method does not assume that the 24-hour recall is an unbiased estimator of the usual intake. This is also incorrect. The NCI Method implicitly states that it assumes that the 24-hour recall instrument is an unbiased estimator of usual intake.

Basis for Sample Size

On page 6 of the draft report, the authors suggest a sample design requiring 7,000 surveys to reach statistical confidence. It is unclear how the sample size of 7,000 was calculated. It is again stated on page 7, based on NHANES and referencing a 2011 EPA analysis of NHANES data, stating that NHANES samples 7,000 residents a year. The sample size for NHANES is calculated for 2-years and data are released in two-year sets. Thus any analysis of NHANES data includes a minimum of two years (thus 7,000 sampled persons if considering those 18 and older), unless the researchers receive permission from NCHS to use only one year.

While it is not clear, it is assumed that the 7,000 is referring to sample size and not number of completed cases. NHANES also has requirements to target and identify specific population groups and oversamples from within these groups – something BSU is recommending against.

The NHANES sample sizes are influenced by the high cost of completing in-person medical visits and not necessarily ideal levels of precision for a specific research question on fish consumption. More evidence needs to be provided that this sample size will meet the needs for IDEQ. This is especially true given the need to identify high frequency fish consumers.

It is important to note that NHANES is an intensive in-person survey with substantial resources for maximizing survey response. This level of success, in 2011-2012 interviewed response rate was 72.6% and examined response rate was 69.5% , should not be expected, especially if a different mode of data collection is used, or resources are limited (e.g. see response rates listed for surveys on page 8 of BSU document).

Mode of Data Collection

Telephone-Mail/Internet-Telephone Approach – page 29-30: It is not clear why this approach is suggested as it has little basis in the survey literature (see work by Edith de Leeuw and work by Don Dillman). Generally multi-mode survey approaches begin with the most inexpensive mode and move to more expensive modes (usually involving an interviewer). That approach minimizes costs and uses additional modes to maximize response. As described here, this approach is likely to realize the lowest overall response as respondents must participate in multiple phases (phone then mail; phone then web) and some attrition is likely between phases. Response rates are calculated as the product of the yields of the various contacts, thus more contacts inevitably reduces response rates. The proposed approach would reduce cost at the expense of response. The idea of ‘the mixed method’ is grossly misinterpreted (why switch someone to mail if they are ready and willing to respond once reached by phone?). Mixed-mode designs use a series of sequential modes to target non-respondents. In the suggested approach respondents must first be contacted (and essentially recruited) by telephone before completing the survey of interest in a different mode.

Additionally, telephone sampling frames (land or land plus cell) will have the lowest coverage properties compared to area samples (in-person) or address based samples (mail, in-person). There is ample work that has illustrated hybrid methods that use addressed based sampling (ABS) frames with telephone data collection. These are desirable in cases where the interview must be computerized due to complexity or looping (repeating portion of the interview) –while maintaining the beneficial coverage

properties of ABS frames. Hybrid approaches match the address to telephone number, and then collect a telephone number by mail for those that are 'unmatched'. Match rates of 40 to 50 percent can be expected, and it should be noted that response can be low to requests for telephone numbers.

The authors include cost-effectiveness as strength of this method (Strength 3, page 30). However, this is only cost-effective relative to in-person or a telephone-only interview. Cost savings may not be realized with the additional costs of mailing and developing a web instrument.

Specific Comments

Executive Summary – page 7

BSU does not recommend that IDEQ take extraordinary efforts to attempt to identify [sample] these groups [hard to reach subgroups] beyond those captured in the sample frame. BSU provides as their reasoning for this that they will have a better idea of how well this group has been captured [identified as respondents], and 'to the extent possible' weighting adjustments can be made.

There is little information on the sample frame that BSU plans to use. The probability that hard to reach populations will be sampled will depend upon the frame used. Undercoverage of some hard to reach groups (e.g. low income; minority) is well established within RDD landline frames as well as their reduced response propensities. Applying weights to these groups may increase the variance of estimates and reduce precision of estimates.

It is important to determine to what extent hard to reach groups consume fish in different patterns than other groups. If hard to reach groups are more likely to be fish consumers, they should be oversampled.

Idaho Resident – page 10

This definition may not be as straightforward as suggested. Newly located residents recently moved from another area/state may differ from longer term residents. At the least it may be worthwhile to collect the length of time the sampled person has lived within the state.

Suppression rates – page 12-13

It is not clear what is meant by the recommendation to ask the suppression question "as a positive and as a negative to verify for consistency"... However, the comments of September 24, 2013 (attached) advised against asking hypothetical questions about changing circumstances which could lead to more or less consumption. Pg. 20 says "The questionnaire queries Idahoans' perception of whether their current consumption is different than their past consumption or their desired consumption."

Fish consumption vs. total diet – page 13

The plan is to focus only on fish consumption rather than total dietary intake. The arguments presented are certainly valid – asking about all foods consumed increases respondent burden as well as the cost. However, it's not clear how the final two sentences in the paragraph justify this. Also, it is common for respondents to forget about ingredients of mixtures when reporting about single food items. The

instrument would need to be carefully considered – there are validated instruments available that ask only about fish consumption which BSU should consider using or building from.

Survey respondents – page 15

The statement that “the data collected from the two methods will be comparable” should explain how this will be ensured. One approach will use the household unit, where if understood correctly one individual responds for the entire household. This will be subjected to bias as the household member may not know of all consumption activities for all household members (e.g., foods consumed in a school cafeteria or by another adult eating a lunch at work). Further telephone data collection will have higher nonresponse than in-person increasing the potential for bias in the telephone mode.

More thought should be given to the decision to use telephone data collection, since this is driving the data collection unit (household/individual). While telephone data collection is less costly compared to in-person data collection, telephone response rates have been decreasing for the past decade and with the rise of cell phone use, RDD landline frames have increasing coverage problems (possibly higher than 20% undercoverage). While these frames can be supplemented with cell-only frames, these also suffer from low response. Discussion should be provided for how this undercoverage will be dealt with or how it will affect estimates.

Portion Groupings – page 19

Empirical evidence should be provided that the “deck of cards” and “slice of bread” approaches for estimating portion size are: 1) valid measures and can be used consistently across respondents; and 2) are not cognitively difficult processes for respondents. The Academy of Nutrition and Dietetics recommends using the comparisons found here:

<http://www.eatright.org/kids/article.aspx?id=6442468830&terms=tennis%20ball>. A publication used tennis balls and golf balls: <http://www.ncbi.nlm.nih.gov/pubmed/15250844>.

Additionally, consider using the methods provided in What We Eat in America, the dietary interview component of NHANES, which uses the items shown here (there may be a fee): Food Model booklet: http://www.cdc.gov/nchs/nhanes/measuring_guides_dri/2002/fmb.htm

Measuring cups and spoons:

http://www.cdc.gov/nchs/nhanes/measuring_guides_dri/2002/measuring_cup_spoon.htm

Household spoons: http://www.cdc.gov/nchs/nhanes/measuring_guides_dri/2002/spoons.htm

For in-person interviews, these guides would just be carried by the interviewer. For telephone interviews, they can be mailed to the respondent.

Gender Proportionality – page 21

Gender balance is not necessarily important for estimating consumption rates for each gender. However, it will be necessary to complete a desired number of interviews with each gender to make estimates with a given level of precision. There are a number of sampling methods available (for telephone data collection) that will randomly select an adult within the household. It should be noted that with telephone modes, even with random sampling methods, females tend to respond and say they are the selected person more so than males.

Age Scale – page 21

Aside from consent *issues*, should respondents under age 18 be interviewed? Most surveys typically ask for older minors to respond for themselves (with parental permission). Perhaps this is logistically difficult by phone, but is anything being lost this way? Parent proxy data can be problematic as described above. See NHANES guidelines on proxy interviews for child participants: http://www.cdc.gov/nchs/data/nhanes/nhanes_11_12/Dietary_MEC_In-Person_Interviewers_Manual.pdf

Idaho Caught Fish – page 25

Empirical evidence should be provided (e.g. identify surveys/data confirming these statements) for the source of fish for restaurants and markets. This may vary based on restaurant (chain vs. local) or market type (chain grocery or specialty market). These data will also be useful for providing an adjustment factor for those that report the source of the fish was unknown (if they report restaurant or market).

Food Frequency Questions – page 25

The plan includes a 24-hour recall, and then asking about consumption over the past 7 days excluding the past 24 hours. Our previous comments indicated that this is a difficult and likely error-prone cognitive task for the respondent. Why does the plan not include a longer period of observation for infrequently eaten foods? The plan for capturing seasonality of consumption is not clearly defined (pg. 6).

In Person Interviews – page 28 – limitations

It is unclear why shorter questionnaires are listed as a limitation. While longer questionnaires will impact overall costs, the link between survey length and response is somewhat mixed in the survey literature. Generally shorter questionnaires are preferred for any mode, but if a longer questionnaire is necessary, in-person modes are optimal. This is due to the availability of an interviewer to motivate response.

Limitations to sample size are only limited based on costs (see limitation 1). In-person modes generally require clustering of samples within areas to manage costs. This will reduce the effective sample size reducing precision or requiring larger samples.

While participant acceptance for allowing a stranger into their home may be a reason for nonresponse, in-person modes generally enjoy higher response than other modes. This would be an unfounded limitation when compared to other modes.

Telephone Surveys – page 28

They mention “respondents who have been randomly selected for participation” but do not indicate how this will be done. Does this involve HH screening and enumeration?

Strength 3: this is only relative to in-person modes.

Strength 4: this overstates the relative success of telephone data collection. In-person modes will generally achieve higher response than telephone modes. Further, recent advances in address based (ABS) methods have shown mail data collection approaches to yield equivalent or better response than telephone approaches. (for more see: Brick, J.M., Andrews, W.R., Brick, P.D., King, H., Mathiowetz, N.A., and Stokes, L. (2012) Methods for Improving Response Rates in Two-Phase Mail Surveys. Survey Practice, 5(3))

Limitation 1: The mention of caller ID as a reason for reduced telephone mode response rates needs empirical support. It is not clear that any literature states caller ID is used by respondents to avoid unsolicited calls. While this is widely accepted, what literature is available shows no support for the claim that caller ID has affected response.

Limitation 3: it is not clear what is meant by 'random dialing'. If this refers to RDD landline frames, this limitation will not be addressed due to increased undercoverage of landline frames (generally due to increase cell-phone usage). While dual-frame sample designs can alleviate this, they are more costly and suffer from increased non-response

Mail or Internet Surveys – page 29

Strength 4: while social desirability is reduced in self-administered surveys, the extent to which such bias may be present for fish consumption surveys may be low.

Strength 5: it is not clear what is meant by a 'wider range of questions,' which can be asked in self-administered mode. Given the generally accepted increased response for in-person modes, the greatest burden (i.e. length, or number of questions) and cognitively difficult tasks would be better suited for in-person. For self-administered surveys it is generally necessary to simplify questions and tasks because of the lack of an interviewer or in the case of mail surveys, lack of computerization.

Limitation 1: While not at the level of in-person surveys, many mail surveys have been shown to meet or exceed the level of response achieved by telephone surveys.

Limitation 3: This is true for internet/web surveys. However, for mail surveys the rise of address based sample (ABS) frames using the United States Postal Service Delivery Sequence File have been shown to have high coverage of the U.S. population. ABS frames far surpass RDD landline and cell phone frames in terms of coverage of the population. There has been shown to be some concern with rural and multi-point drops (e.g. high-rises apartment complexes).

Limitation 4: It is unclear how this is different from limitation 1.

Limitations of internet surveys do not mention lack of internet access for some portion of the population. However, it appears that telephone interviews will also be an option.

Budget and Sample Size – page 32

It is assumed that 80% of Idahoans eat fish monthly and therefore, 2 recall questionnaires from 1 respondent will yield sufficient data. However, on pg. 33, it states that “Idahoans reflect the national average that about 50% seldom or never consume fish.” Maybe this refers to just fish from Idaho, but it is not clear.

Conclusion – page 36-37

The conclusion suggests a survey targeting all adult Idahoans and Idahoans with a fishing license. The discussion should provide information on the source of the sample frame, expected coverage of the population (Idaho), and potential issues (likely undercoverage). The discussion should also describe if there will be any oversampling or stratification of particular areas (e.g. areas near bodies of water; rural areas; areas with high minority concentration).

Comments on Questionnaire

Comments were provided an earlier draft of the questionnaire (9-24-13; attached). Many of these comments were addressed, including changing the consumption frequency categories, clarifying that the 7-day recall period excludes the 24-hr recall period, clarifying questions where respondent can choose more than one response, adding a response about “not liking fish” to 13A. Comments that were not previously addressed are repeated below. In general, the questionnaire overall is very complicated; were these questions drawn from validated instruments? If not, why not? There are several validated questionnaires on the NCI website that assess fish consumption, should a 24HR not be desired. Additionally, it is advised to have questions scripted for interviewers to increase the likelihood of comparable data. Essentially it is important to establish uniform delivery (i.e. standardized interviewing) so that respondents are receiving the same question(s). For example if interviewers are not provided with guidance or specific question text, they may provide respondents different interpretations in an effort to help the respondent. If they ask whether they ate any fish in the last 24 hours, without guidance some interviewers may instruct respondent to think about the past day if they have not yet had all meals for their current day.

Intro to Questionnaire

It should not tell respondents that it will take longer if they report eating Idaho fish. This could bias the respondents to under-report consumption. It should instead say something like, “the length of the interview will depend on your answers, but it could take from 5-15 minutes.”

24-hour Recall [comment included in previous review]

The “last 24-hours” may vary based on when it is asked and how people think about meals within the last 24 hours. Standard 24-hour recalls ask about the previous day, from 12:00AM to 11:59PM.

Q6A, Q7A, Q9B, Q10A [comment included in previous review]

Consider using wording of a lower grade level or more conversational words (e.g. get vs acquire; eat vs consume). More conversational terms will be more widely understood by respondents.

Q9A (first instance) & Q11B [comment included in previous review]

While the purpose of the size prompts (deck of cards) is to make it easier for respondents to report what they ate, as structured the current prompts used may be cognitively difficult. If the interviewer is completing the task for the respondent there may be acquiescence bias. The respondent may be unable or unwilling to check the interviewer's math and will agree with whatever the interviewer provides as a reasonable answer.

While this is a paper version of the telephone questionnaire, for Q9A the response categories do not allow for precise fish weights to be entered. E.g. if the respondent says 6 ounces, will the interviewer be required to convert to checkbooks or deck of cards? This is not clear in the paper version provided.

Q9A (second instance) [comment included in previous review]

24 hour versus 7 day recall. A 24-hour recall of foods is a standard method of collecting short term dietary intake; research clearly shows that asking respondents to report actual intake more than 48 hours from the time of reporting decreases accuracy and reliability. As mentioned above, a combination of a 24-hour recall to capture specific information about the type, preparation and portion of fish eaten combined with an FFQ is more likely to yield reliable data. The period of time for the FFQ does not need to exclude the time for the 24-hour recall; attempting to do so is cognitively difficult for respondents. Note that a standard 24-hour recall means the previous day, from 12:00AM to 11:59PM, and is not based on the time of reporting.

Q12A & Q13A

As written this question is a single yes/no. That is, the list is read then the respondent is asked if any of these reasons apply to them. This will require the interviewer to re-read the list, or the respondent may interrupt the interviewer while the list is read. Suggest rewording to:

"Some people eat more fish or seafood than others for a variety of reasons. Tell me if any of these reasons apply to you." READ EACH ITEM IN LIST AND WAIT FOR RESPONSE.

For respondents who are incidental fish consumers, for example, eat fish because it was part of what they were eating (anchovies on pizza), or an ingredient in an appetizer. Suggest adding a response category, it was on/part of something else I was eating.

Question 13A, to a small degree, presupposes the respondent limits, or tries to limit their fish consumption. Suggest first asking a filter question as to whether or not the respondent limits their fish consumption. Further these reasons may vary between fish and seafood (e.g. shellfish). Consider whether or not it is important to measure both.

Q16A[comment included in previous review]

As written this item does not follow current OMB standards for collect ethnicity and race. While for this study it may not be necessary to follow OMB guidelines, comparison with other study results will be

needlessly complicated by the different approach. OMB guidelines first ask Spanish, Hispanic, Latino origin, then race and it should be mark all that apply. See http://www.whitehouse.gov/omb/fedreg_1997standards

Q17A[comment included in previous review]

This question should be separated into two items. The first question asks if the respondent is a member of an Idaho tribe. If yes, then ask which tribe.

Q21A

Why not ask for the entire zip code? This does not appear to be a very sensitive item and it may be easier for respondents to just say entire zip, or they may do so regardless.

Q23A

Asking for permission to call back is not recommended. Instead, just inform the respondent that they will be called back in a few months.

DRAFT Survey Questionnaire for the Idaho Fish Consumption Survey

As an overarching concern, and in addition to the comments on the actual instrument, it is critical that other aspects of the study such as sample size, expected response rate, mode, analytic precision requirement and analytic approach are considered in order to determine the ability of a study to successfully address needs.

A brief review of the Idaho draft Fish Consumption Questionnaire (9/11/2013) resulted in a number of specific comments and suggestions about the instrument itself (below). These comments include concerns about the response categories, types of questions appropriate for proxy responses, question structure, level of difficulty for respondents to answer, ways of determining fish portion sizes, etc. However, it is not possible to provide a full evaluation of a survey instrument in isolation from a broader understanding of the study's objectives and goals. Ideally, study objectives would be mapped to items in the instrument to confirm that each objective is adequately addressed and that each item in the instrument serves its purpose of capturing information to answer study questions. The appropriateness of the survey instrument also depends on a number of broader factors, including the following.

- What is the sample design (e.g., who are the respondents?)
- What degree of specificity is required with regard to distinction between, or groupings of, fish species?
- What is the mode of survey administration (e.g., will the instrument be computerized to allow for better edits during administration?)
- Who is the survey obtaining information about (e.g., what is the population of interest?)
- How will the survey data be used (e.g., will data be used to compare with national data or data from other surveys?)
- What are the planned data preparation methods (e.g., would items be better suited for open-ended responses or close-ended response categories?)

In summary, an evaluation of the survey instrument must be done in concert with a thorough understanding of all study objectives and a point-by-point review to determine, at each step of the process, whether the best approach has been chosen. If it is necessary to make compromises for reasons such as budget resources, limited time, or other factors, then the trade-offs must be carefully considered and the developers must ensure that survey objectives are still being met in the best possible way, weighing all factors.

Specific Survey Instrument Comments

1. Q1 – this is a double-barreled question (two questions in one). This should be asked as two separate questions.
2. Q3 – These frequency categories may be acceptable, but there are others which may be more standardized (and could be compared to other surveys). Also, response categories are not mutually exclusive.

3. Q5 – This may vary based on when it is asked and how people think about meals within the last 24 hours. May want to consider anchoring or asking about last day.
4. Q6/Q11/Q18 – Bracketed text – why does this only ask about first of these meals? Again this may vary depending upon when it is asked if fish consumption is related to meals.
5. Questions about portion size – the size codes (e.g., cards, checkbook) do not include thickness. Checkbook is not typically used. Again, there are standardized ways of obtaining portion sizes. Also, Q25 – Asking the respondents to compare other HH members’ portion sizes to their own lacks precision.
6. Q7 and others – It appears that a prompt will be developed that interviewers can read if necessary. However, better (and more standardized) data will be obtained if these prompts are included within the question read to all respondents.
7. Q7/Q12/Q19/Q24 – Consider more conversational wording (e.g. get versus acquire). Depending upon education, some respondents may not understand acquire.
8. Table on pg. 9 – No. of portions eaten – are each of these time periods meant to be mutually exclusive (e.g., week not inc. last 24 hours, month not inc. last week, etc.)? The series of questions starting with Q24 leads one to think that. Difficult concept for the respondent.
9. Q9 – Asking the respondent to recall meals over the past week is a difficult cognitive task. Asking for detailed information about fish eaten at each meal will likely lead to recall bias.
10. Q14 - What are “other members” and “other individuals”? This is unclear and inconsistent. Suggest using ‘household members’, or simpler ‘people living at this address’. Respondents tend to forget about non-family members living at the same address.
11. Q16 and others – Asking the respondent to report fish consumption for other household members will result in reporting bias. It’s unlikely for someone other than perhaps a parent of a very young child to know everything that another HH member consumed during the past week - particularly since this also would include food consumed outside of the home.
12. Q15 – Without obtaining first name of other HH members, the series of questions that follow would be difficult to administer.
13. Q17 – Should this exclude the last 24 hours like question 9? Or should this be more like Q5?
14. Q26-28 – It appears that multiple responses may be required. Are these intended to be “code all that apply”?
15. Q27 – Response category – what if the respondent just doesn’t like fish?
16. Q28 – It is highly speculative to ask what circumstances would have to change in order for the respondent to change current habits.
17. Q30 – Does not conform to approved OMB race/ethnicity questions. Hispanic should be a separate question. Also needs to be code all that apply.
18. Q31 – Double-barreled question, should be asked as two separate questions.
19. Q32 – Should make sure that these income categories are comparable to any other data to be used for this population or any comparisons to be made.
20. Q33 – While weight is an important variable, self-reported weight is known to be frequently mis-reported.
21. It appears that Q29-33 are intended for the respondent only. If data are being gathered about all HH members, won’t these demographics be important for each HH member as well?
22. Part and amount of “fish” consumed – is the intent to code all that apply (given that multiple fish types are grouped)? – Respondent may eat the whole fish for some types and only the flesh for others, for example. This approach will lack precision for specific fish species.

EPA COMMENTS ATTACHMENT 2. (11/19/13)

Introduction

The Idaho fish consumption survey instrument and supporting materials have undergone a great deal of work and revision and are much improved relative to earlier versions.

Nonetheless, there are still areas where further work is needed. It would be useful to summarize all the steps required to bring the survey to fruition and identify IDEQ's expectations as to who will be responsible for each of these steps.

Will there be a final study design document prepared after review and discussion of these documents that will clearly summarize how the survey will be conducted and how the data will be evaluated? The current documentation is a mixture of background material and a discussion of potential development choices for the Idaho survey. The specifics of the Idaho survey need to be clearly presented for both the general population and recreational anglers.

The following list summarizes issues of concern:

1. The implications of not being able to obtain sufficient data to employ the NCI method must be considered. IDEQ may want to consider the inclusion of a food frequency questionnaire as a backup should analysis by the NCI method not be feasible.
2. The derivation of survey sample size required for each population needs to be more clearly presented.
3. The discussion of the NCI method needs editing to insure accuracy (SEE email forwarded from Dr. Kevin Dodd).
4. The use of a mixed 24 hour / 6 day recall approach is not recommended. The reliability of information from a six day recall approach differs greatly from that of a 24 hour recall.
5. If a 6 day recall approach is retained, then it is recommended that the questionnaire focus on collecting information on a meal specific basis rather than collecting it on the basis of information categories (e.g. consumed in Idaho or not). Looping back through all of the meals repeatedly to complete successive information categories will be cognitively difficult for the respondent.
6. Information to be collected in the survey needs to be mapped back to the objectives of the survey to insure that sufficient, but not extraneous data are collected.
7. Please be clear about the population you are trying to protect. Is it people who eat fish from Idaho waters, people who eat any kind of fish, or both? The current document is confusing as to what is the population of interest. In some places it implies that the population of interest is the individuals consuming fish or shellfish from Idaho waters, but there are statements throughout the document that appear to refer to the consumption of total fish (including canned tuna for example).
8. Discuss why the survey is not addressing children's fish consumption. Children may be at disproportionate contaminant associated risk during development and may have higher intake rates per unit body weight than adults.

9. Discussion of how each population of interest (i.e. general population and recreational anglers) will be surveyed needs to be separately and clearly presented. Whether the same questionnaire will be used for each population needs to be specified. The choice of a telephone, mail or internet approach for the survey needs to be explicitly and clearly defined. The report seems to suggest a mail contact to ascertain interest followed by a telephone interview, but references to other survey approaches create confusion.
10. Is only one person per household to be interviewed? Several? If several are to be interviewed, how will correlation be dealt with?
11. Though background materials discuss general strengths and weaknesses of various survey approaches, there should be a discussion of the strengths and weaknesses of the survey approaches to be used by IDEQ specifically in relation to collecting information on the target populations for the Idaho survey (i.e. recreational anglers and the general population).
12. Further work needs to be done to examine how well the proposed portion size models can be used to quantify fish consumption. If mail or internet modalities are used, the use of image based portion size representations should be considered.
13. The question skip/flow pattern of the survey does not seem appropriate in some cases and should be carefully examined.
14. It is still unclear why the survey attempts to bin responses into ranges and groups rather than asking for specific values for data items (e.g. age, body weight, specific species consumed). Grouping and binning leads to loss of information. Precise responses can be grouped later into any categories deemed appropriate.

Comments on main text of “IDAHO FISH CONSUMPTION RATE RECOMMENDED SAMPLE AND QUESTIONS”

P5, outline item 2a: The 90th percentile and potentially others should be included as well. It may be worthwhile to characterize the distribution of the data too.

P5, Executive Summary, 1st para: More specifically, IDEQ did not consider data on high fish consumers.

P6, para 2: The document states that “up to 7,000 surveys” will be required. This is quite vague. Can more detail be provided? Do you mean that the sample design will include a sample size (up to 7,000 surveys) that is sufficient to reach pre-determined levels of statistical confidence? What if 7,000 is not sufficient to reach an acceptable level of confidence?

P6, para 3: Also add discussion of bias introduced by using a survey methodology that is potentially not accessible to individuals without access to the internet or stable addresses?

P6, 2nd to last para: Not clear as to what increasing the research design means.

P6, final para: Distributing administration of surveys over the seasons of interest would seem appropriate. Re-interviewing individuals in each of the three seasons would also be another approach.

P7, 1st para: Some discussion of U.S. census data and the small percentages of unique ethnic groups present in the Idaho population would seem to be appropriate. Further, there should be some analysis of the fraction of the population that has internet access.

P7, para 1: The end of the 2nd sentence of this paragraph should say “whose culture traditionally includes consumption of fish.”

The word “decent” in the last sentence of the 6th paragraph should be “descent.”

P7, FCR Surveys and Articles: In the 2nd paragraph on NHANES it says, “The consumption of food frequency can be reliably estimated, it is more problematic to derive the quantity of fish consumed.” Please explain. Also, the last sentence of this paragraph refers to “this survey”, but it is not clear to which survey it refers; do you mean the NHANES survey?

P7, FCR Survey and Articles, general comment on section: Please add reference citations for the studies in this section (e.g., CRITFC, Washington Dept. of Ecology, etc.).

P7, final para: To the best of my knowledge, NHANES did not use the NCI method. The State of Washington has re-analyzed the NHANES data using the NCI approach.

P8, WA Dept. of Ecology Fish Consumption Rates: Identify the technical support document and identify the individual surveys that WA has relied on.

At the end of the paragraph on the Washington study, it states that the surveys produced a mean range is 6 g/day for fresh water fish to 214 g/day for the Squamish tribe. Does the mean of 6 g/day for freshwater fish apply to the general population; is the 214 g/day for the Squamish Tribe also for fresh water fish? Without some clarification the reader does not know if these values are comparable in terms of the type of fish or population represented.

Editorial: various populations.

Not clear as to what the point is here. Ecology’s TSD reviewed studies that have already been completed.

Might be useful to add a table including additional statistics.

Change to Idahoans or Idaho.

P8, IDFG Annual Angler Survey: In the section on IDFG Annual Angler survey, it is not clear what the following statement means: “The relatively high response rate may be due to the involved stakeholders with the health of fish populations.”

P9, Behavioral Risk Factor Surveillance System: The word survey at the end of the 2nd sentence should be plural, and in the 3rd sentence the word ‘about’ should be inserted between “the survey asked” and “both the frequency.”

P9, A New Statistical Method...: In the section on A New Statistical Method..., the word ‘method’ should be inserted after “NCI” in the 4th sentence. It is not clear what is meant by the last sentence in this section.

P10, target population - Why not include children in the study; like other studies, adults could be asked about children in their household (i.e., are they eating the same fish as the adults, how do their portion sizes and frequencies differ from those of the adults?)

P10, survey respondent – The last statement in this section says that the survey will target individuals as the survey unit, but this appears to contradict what is said on page 15 under Survey Respondents where it says that IDEQ desires to collect data by household. It is not clear to me who is being surveyed, the household or the individual.

P11, Non-Fish Consumer: IDEQ’s quantitative analysis of the impact of misclassification of consumers vs. non-consumers needs more rigorous review and should not be cited as accurately characterizing this issue until such a review has been conducted.

What is the 90th or 95th percentile mean?

The statement that “The potential of the error significantly shifting the 90th or 95th percentile mean significantly is remote” may be true when you consider anyone who eats fish (as indicated by the discussion in the slides presentation), but may be not be true when only consumers of Idaho fish are considered (43% are non-fish-consumers).

P11, Idaho recreational angler: Youth anglers will be excluded, but why can’t adults be asked about their children’s fish eating habits?

P12, minority populations: This section states that if representation is a concern, census data will be examined after the data are collected. Why not evaluate the census data beforehand and target a representative sample?

Subpopulations have members that are high fish consumers?

P10, Survey Respondent: Would you try and get multiple individuals from the same household? If so, then there needs to be discussion about how potential correlation in consumption rates could be addressed.

P12, Suppression Rates: Editorial: Change to suppressed rates?

More specifically, suppressed fish consumption chiefly relates to populations that may have decreased their fish consumption over time. Suppression may result from a number of factors. These factors include: changes in habitat reducing fish populations, reduced access to fisheries resources due to land ownership restrictions, fear of contamination in fish, and changes in family social structure that preclude spending time harvesting fish. The phenomenon of suppression is often discussed in relation to the consumption of fish by Native Americans.

Questions could be included to determine whether intake was less than during previous periods or less than desired and why. A list for the respondent to choose from of possible reasons for not eating at the same rate might include: health concerns, concerns about contaminants, availability of species, changes in leisure time, loss of access, difficult access, etc..

P13, 1st paragraph: The Wabanaki study addressed how to establish a baseline of resource use, but didn't really review and discuss the factors contributing to suppression.

P13, bulleted list: Is the intent to ask survey respondents if these factors are modifying their fish consumption?

P14, survey methodology: Will there be an issue with consistency in the interpretation of results if different survey methods are used?

P15, minority populations: How will this issue be addressed?

P15, consumption suppression: How will this issue be addressed?

P15, Survey Respondents: SEE page 10. This seems to be in conflict with Idaho's earlier definition of survey respondent.

P16, 2nd para: Wouldn't seasonal variation potentially be a factor contributing to within person variance?

P16, including respondents' weight: It would be useful to collect self reported body weight data so that the intake rates could be normalized to body weight. Since intake rate and body weight are correlated, it makes sense to express the FCR on a body weight basis.

Page 16; 5th para: Reference where the NCI method is explained.

P18, 1st para: Define "incidental" and "non-game."

P18, 2nd para: It is still unclear to me as to why coding is needed at a group level. If species are identified, then grouping can be done after consumption is recorded. Grouping species

together and using a code for consumption of all species within a group results in loss of information.

P19, Portion Groupings: the text states that there is no real way of determining the quantity eaten for mixtures. Would it help to consult EPA/OPP's Food Commodity Intake Database for recipe information?

If the survey is going to use the internet, might it not be possible to use portion size images?

Page 20; 5th line from the top: What survey methodology will be used? It is implied here that there will be an in-person interview. The impression created earlier is that the survey was a mailed contact with a telephone follow up.

P20, Demographics: Another purpose for collecting survey demographics is to determine how well the survey population reflected characteristics of Idaho's population. If the survey and State populations don't compare well, it may be necessary to collect more data.

P21 Gender Proportionality: Gender will be selected at the beginning of the survey to ensure representativeness. Why not race and other factors?

P21, Questionnaire Introduction: Discuss how introducing the survey may bias the response.

P21, Age Scale: It is still unclear as to why ages simply can't be recorded and then categorized after the fact.

P24, Weight Scale: Why not simply record the body weight? Use of body weight classes will add uncertainty to computations of consumption in terms of grams of fish per kilogram per day.

P25, Food Frequency Questions: Previous comments have noted that the quality of intake information greater than 24 hours will differ from that of 24 hour recall. There should be some discussion of this issue.

P25, Idaho Caught Fish: Adding a question as to whether or not each fish item consumed is from Idaho waters would simplify this.

P25, Portion Size: This section is inconsistent with the discussion of portion size characterization in the portion groupings section.

P26, Survey Methods: Should identify the target populations again and note that the utility of these approaches is being discussed for the target populations of interest.

Further, this broad discussion of survey methods should be followed by a discussion of the strengths and weaknesses of the specific methods chosen for Idaho populations.

P27, Creel method limitations: Additional issues include angler willingness to complete the survey, the fact that only fish caught up to the time of the interview are recorded, and that the angler may not be the person who prepares the fish, thus leading to inaccuracies in characterizing fish consumption.

P27, Diary method limitations: Additional issues are that the literacy of the sample population is required and that daily recording of intake may alter dietary behavior. Additionally, extracting diary information may be expensive.

P28, In Person Interviews: What does “geographically constrained” mean?

P28, Personal Interview Limitations, B2: Disagree. Personal interviews which can be arranged in advance in either the individual’s home or a comfortable location offer the best support for posing a longer, more detailed questionnaire.

P28, Personal Interview Limitations, B4: This can be ameliorated if the sample population is cohesive (e.g. a tribe or ethnic community), the population is briefed to improve their cooperation including support from community leaders and the interviewers are members of the population from which the sample is drawn.

P28, Telephone survey limitations: Other issues are that there are no visual aids for species identification or portion size characterization. Further, individuals without phones cannot participate in the survey. Finally, survey length is limited by the fact that individuals may not wish to be on the phone for a long period of time.

P29, Limitations mail or internet surveys: Additional limitations include literacy of the target population, need for stable addresses – mail survey, and access to a computer/computer literacy/internet connection – internet survey.

P29, Limitations mail or internet surveys, B5: Disagree. Portion size and species photos can be provided for both mail and internet surveys.

P30, Bias from Respondent and Researcher: why is bias lower for an internet survey relative to a phone survey?

P31, Sample Design: This section should be clear as to what are general aspects of sample design and what is specific to the Idaho survey.

Page 32, Budget and Sample Size: A point to consider is that regulators may not wish to use the mean to compute standards, but rather some other statistic (e.g. an upper percentile). Consequently, it is useful to consider how sample size affects uncertainty in other statistics. It is recognized that relating sample size to characterizing the mean is well developed relative to investigations of sample size to characterization of other statistics (e.g. upper percentiles). The RMWL team identified an approach for relating sample size to uncertainty in upper percentiles.

P32, Sample Sizes for the Surveys: Sample size computations should be developed separately and transparently for both the Idaho general population and Idaho anglers. It is unclear how the sample size equation is used. What values are to be used to solve for sample size.

What fraction of the population has to have two days of consumption in order to conduct statistical modeling?

P32, Log Normal Distribution: Transparently present how the needed number of completed surveys was determined.

P33, NCI Approach: Sample size computations based on precision of the mean and data requirements for statistical modeling need to be reconciled.

Expand on this. Transparently explain why 50 to 60 surveys are required.

P33, Idaho Population Sample: It is agreed that oversampling is important. However, current Idaho frequency of fish consumption information should be relied on to a greater degree than old national data.

Expand on: "If we assume that there needs to be 15%..."

P34, Idaho Fish Sample: Editorial: IDEQ seeks to characterize consumption of fish obtained from the waters of Idaho?

P35, Minimizing Sample Size: Derived using assumed lower frequencies of sample size?

P37, Conclusion: The issues associated with combining 24 hour and the following 6 days of consumption data have not been addressed.

Earlier, it was noted that suggestions for accounting for seasonality were outside the scope of this document. The document should discuss seasonality.

The number of required surveys is presented for the general population survey? How about the recreational anglers?

Earlier ranges of required numbers of surveys were identified, why not present those here?

Appendix A, Definitions

P44, Central Limit Theorem: Define what the null hypothesis is in this context.

P45, Normal Distribution: Define using the formula

P45, Probability Density Function: Is the function describing the probability that a variable will have a particular value.

P46, Single Tailed Distribution: Right skewed distribution occurs when the median is less than the mean.

Appendix B, Questionnaire

Q1A: Why is a male needed? How will the interviewer know if a male is needed?

Q2A: How about do you eat seafood at all?

Q2B: Do they really mean to refer the respondent to question #17? Is it 17A? Shouldn't it be go to question 12?

Q3: Specify that seafood includes shellfish.

Q3: There appear to be too many columns associated with ascertaining frequency.

Q3: The need for the "check for yes" column is unclear. The row specifies which time period over which frequency is being ascertained.

Q4A: It was previously mentioned that one might wish to anchor the time frame for the 24 hour survey. For example: "From 8 AM yesterday to 8 AM today..."

Q4A: If no seafood has been consumed in the past 24 hours, what is the purpose in skipping to question 9?

Q6A: Seems like there are too many columns here. Why not provide a list of codes to be entered describing source of food for each meal (e.g. C – caught in ID waters, N – not caught in Idaho waters, U – unknown)?

Q7A: It is still unclear as to why group coding needs to be introduced for species at this point. If species are properly identified, then they can be grouped after information has been entered into a database.

What is the recall period for question 7A?

Q8A: The table format seems to use a great deal of space. Why not provide code values to identify various preparation types? It is not clear why preparation methods are being collected. Potential reasons could be to convert cooked to uncooked weight or to examine contaminant exposure to individuals as a function of cooking method. For example, broiling would result in loss of fat and lipophilic contaminants. In this regard, consumption of soups and stews might

be recorded, as contaminant loss for these methods during cooking is low. Again, this should be a topic for a comparison of survey objectives and data to be collected.

Q9A: Prompt for consumption of recipes that may contain seafood (e.g. stews).

An alternate approach would be to identify the model and then the multiples of the model consumed. Perhaps the interviewer might have a table identifying which model is associated with which species. If the Web is going to be used to support the survey, it is possible that more realistic portion size images might be used.

If the respondent chooses to specify a specific fish weight, rather than use a model, how/where would that weight be recorded?

The prompt should be more descriptive about the relationship between models and portion size. For example:

“I am now going to determine how much fish you ate for your meal. I am going to do this by using common household objects to help determine the amount of fish you consumed. For example comparing the portion size you ate to a deck of cards: Was what you ate half the size of a deck of cards, equal to the size of a deck of cards, two times the size of a deck of cards, three times the size of a deck of cards, etc.

Seven Day Recall: Moving between collecting information on categories of information over multiple meals may be cognitively difficult for the respondent. Likely the respondent will remember information on a meal specific basis. It is true that this may be a more difficult approach to collecting data, but this can hopefully be addressed by use of trained interviewers.

Q11b: How will consumption of soups, stews or other mixtures be recorded?

Q12a/13a: It may be appropriate to specifically ask women their feelings about consuming more fish for the health of the fetus or not consuming fish because of risks to the health of the fetus associated with contaminants in fish.

These questions might also delve into consumption of self caught fish. Questions, related to characterizing suppression of consumption by anglers are as follows:

I would like to catch and consume fish, but:

- I have to travel too far or can't access fishing locations.
- I have taken a job or have other commitments that don't permit me to spend time fishing.
- Even though I can get to fishing locations, there aren't fish there to catch.

-I am concerned about the level of contaminants in fish.

Perhaps these questions might be incorporated into the angler survey.

Q15A: It is unclear why there is a need to bin ages as ranges rather than provide actual values. The collection of specific ages offers the flexibility to bin the data for comparison with other data sets. The rationale for binning should be provided and discussed.

Q16A: What is the rationale for skipping to Q23 for non-Native Americans? Skipping to Q18A seems logical.

Q18A: Clarifying the purpose of questions is important. As previously mentioned, the survey should collect only the information needed to meet survey objectives. This analysis should precede the survey instrument.

Q20A: It is unclear why there is a need to bin body weights as ranges rather than provide actual values. The collection of specific body weights offers the flexibility to bin the data for comparison with other data sets. The rationale for binning should be provided and discussed.

Q21A: Determination of spatial variation in fish consumption is useful and will also allow determination of geographic coverage of the State. However, it would be useful to have more background information provided for the intended use of the data.