

**In-Depth Interviews for the Evaluation of Existing Web-
Based Nutrition Analysis Applications to Guide the
Development of WeNDI (Web-Based Nutrition & Dietary
Intake) for the RPAH Allergy Unit**

NUT422

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Abstract

Aims: To determine the attitude of patients at RPAH Allergy Clinic to using a computer to enter their diet record, and to gather information about the patient's experience using different internet diet record programs in order to assist the development of an internet based diet record and analysis program suitable for use in the Allergy Clinic as well as other dietetic applications.

Methods: Participants were randomly approached and recruited from the waiting room of the Allergy Clinic to participate in the interview on the same day. Participants trialed two web-based diet record programs, *Calorie King* (CK) and *Formula for Life* (FFL), and an in-depth interview was conducted to discuss the participants' opinions of the programs and their attitude to the use of web-based diet analysis programs. Each interview was recorded and transcribed. A coding frame was developed and the data was coded manually and analysed using thematic and content analysis techniques.

Results: A total of 15 in-depth interviews were conducted. Most participants were enthusiastic about the programs, particularly the nutritional feedback. A number of issues were raised by the discussion, including the level of difficulty of the program, computer literacy of the participant, the use of the search functions to find foods, the ability to access dietetic input from home, the benefits of instant nutritional feedback, and features to make food entry more efficient.

Conclusion: The results of this study indicate that many patients of the RPAH Allergy Unit would like to use a web-based program to keep their food record. The issues raised by the participants in the study may assist in the development of a program that is effective and user-friendly.

Introduction

Accurate and thorough nutritional assessment is an essential aspect of any dietary consultation. This is especially important when assessing the adequacy of children's nutritional intake, due to their need for optimal nutrition for proper growth and development, as well as to establish good lifelong dietary habits (Vereecken *et al.* 2005). Children who are unable to follow a normal varied eating pattern, such as those with food allergy or intolerance may be more likely to become malnourished. There are a number of ways to measure dietary adequacy, all with different strengths and limitations. Common methods include food records, diet histories and food frequency questionnaires. A method often used in the Royal Prince Alfred Hospital (RPAH) Allergy Unit is the written food record. Patients are asked to write down the types and amounts of foods eaten, as well as any associated symptoms. This record is then viewed by the dietitian to determine dietary adequacy, often using a dietary analysis program such as FoodWorks. The process is effective, but labour intensive for both the patient and dietitians.

Over recent years, there has been a gradual increase in the use of the internet and computers. According to the 2006 Australian Census (ABS 2006), at least 50% of Australian private dwellings have internet access. In line with this trend, there has been an increase in the use of computers for dietary assessment purposes (Probst & Tapsell 2004). There are a large number of computerised diet record systems available, including both software packages and web applications, which may have application in the clinical setting.

There are a number of advantages to the use of a web-based diet analysis program in clinical practice. Patients completing a food record can enter their meals directly onto the program, minimising the time taken to enter the diet, and removing the need for the dietitian to later enter the data into an analysis program. The instant feedback that is possible from the nutrition reports produced by the program is also an advantage, both to patients and dietitians. The patients are able to see a visual representation of the adequacy of their intake, which may provide motivation to adjust it if necessary, or reassurance that they have an adequate diet. The dietitian is able to see the nutritional quality of the diet at a glance, and so tailor their advice accordingly. Web-based programs are cost effective, as they can be accessed by anyone who can access the internet (Oenema, Brug & Lechner 2001). They can also be updated easily as new food products become available (Oenema, Brug & Lechner 2001). This is an important consideration given the ever-changing nature of the food and nutrition industry. Unfortunately, many of the currently available web-based dietary assessment tools are awkward and difficult to use (Parker-Pope 2006). Food item searches are often laborious,

and serving size options provided are not always helpful. The feedback provided by the websites can also be difficult to interpret without the guidance of a dietitian.

Due to the potential benefits to both patients and dietitians using a computerised tool for dietary records, the Allergy Unit at RPAH has undertaken a project to develop a web-based program suitable for patients to enter their diet records before being reviewed by the dietitian. The project aims to develop a user-friendly internet based dietary record and analysis tool to aid dietitians in the analysis of the nutritional and chemical content of patient diets in a manner that is both time and cost effective. As part of the development of this program, a number of in-depth interviews were conducted with patients visiting the clinic. The aims of these interviews were:

- To determine the attitude of patients at RPAH Allergy Clinic to using a computer to enter their diet record
- To gather information about the patient's experience using different internet diet record programs in order to assist the development of an internet based diet record and analysis program suitable for use in the Allergy Clinic as well as other dietetic applications.

Literature Review

In recent years, a number of different computerised dietary analysis programs have become available, using various software programs and internet applications. A number of research papers have aimed to address the use of these programs in dietetic applications, in both clinical and research settings. There are several benefits to the use of computerised dietary analysis that have been described. In a clinical setting, the key advantage of computerised dietary analysis programs is their ability to make the nutrition counselling session more efficient. Diet analysis is an integral part of the nutrition counselling session. It is common for the dietitian to spend a significant amount of time gathering a diet history from the patient in order to obtain an accurate picture of their usual intake. Using a computer program to assess the patient's diet in advance enables the dietitian to focus more time on providing the relevant advice to the patient (Probst *et al.* 2005). Traditional diet histories also have a number of limitations in their usefulness (Probst *et al.* 2005). They are time consuming, and are limited by both the dietitian's ability to ask the necessary questions and the patient's ability to accurately report their usual intake (Probst *et al.* 2005).

There are a large number of web-based dietary analysis applications available on the internet. These programs are becoming more popular as internet and computer use increases throughout the developed world (Painter & Sabbert 2001). Some programs receive thousands of hits each month, mainly from the USA and Australia (Painter & Sabbert 2001). Many of the programs have a specific focus, such as weight loss. Researchers and other nutrition professionals are reportedly using internet based dietary assessment tools in their work (Painter & Sabbert 2001). Herbold & Dennis (2001) recognised the potential for these applications to be used for online consultations with a dietitian in situations where face to face contact is not possible. This may be particularly useful in rural practice or when specialist services are required. Unfortunately, many of the currently available diet analysis tools have too many options or a complicated layout that is confusing to inexperienced users (Parker-Pope 2006).

Probst *et al.* (2005) investigated the use of a computer assisted dietary assessment tool for use in a primary healthcare setting. A number of focus groups were conducted to ascertain the attitude of older adults with Type 2 Diabetes toward the use of computers to enter their diet histories (Probst *et al.* 2005). The design of the computer program was found to be important. In particular, it was found that software needed to be simple and efficient to use; participants varied in the amount of time they were willing to spend entering dietary data (Probst *et al.* 2005). They also reportedly enjoyed receiving instant feedback from the program about the quality of their diet (Probst *et al.*

2005). The ability of computerised dietary analysis programs to provide personal and instant feedback has been reported in the literature to be one of the strengths of using this form of dietary assessment (Oenema, Brug & Lechner 2001). The randomised controlled trial conducted by Oenema, Brug and Lechner (2001) examined the impact of tailored nutritional information on the internet on the subjects' recognition of problems with their diet and their subsequent motivation to change their eating habits. The results from their study suggested a very positive effect on subjects' awareness and motivation to begin dietary change when participants received personalised feedback via the internet (Oenema, Brug & Lechner 2001). However, these results must be interpreted with caution due to a number of limitations within the design of the study, such as the possible recruitment of a non-representative sample of subjects who had a higher interest in nutrition than the general population, and the highly controlled conditions of the trial (Oenema, Brug & Lechner 2001). Nevertheless, this study does provide promising feedback for the use of computerised dietary analysis in clinical settings.

Another study examining the use of a computer based dietary analysis tool was conducted by Heetderks-Cox *et al.* (2001) using US Air Force personnel receiving nutritional counselling for weight loss. This study provides a useful comparison between a computerised diet record and a more traditional written record. The general application of the results of the study is limited by the specificity of the sample, and the small sample size of 24 subjects. There were a high proportion of drop-outs from the original sample (43%); however the proportion of drop-outs from the intervention and control groups was similar. The drop-outs tended to be younger and had lower education levels than those who persisted with the study, indicating that the food records were better received by older and more educated subjects (Heetderks-Cox *et al.* 2001). A further problem occurred in the design of the study; participants assigned to the computerised diet record group were those who signed up for participation in the study earliest. These may therefore be more interested in recording their diet than those who signed up later, who were assigned to the control group, making it difficult to know the reason for the reported improvement in diet recording using the computer (Heetderks-Cox *et al.* 2001).

Despite the limitations, Heetderks-Cox *et al.* (2001) were able to identify a number of useful considerations for the use of computerised diet records in comparison to written records. Participants appeared to enjoy working on the computer, and did not find it to be labour or time intensive, even though the time spent keeping the record was reported to be similar to that of the participants keeping a written record (Heetderks-Cox *et al.* 2001). The quality of the food records kept by the participants using the computerised diet record tended to be higher than those of

written records, as food portions must be quantified. Written records are frequently incomplete, with unquantified portion sizes such as 'a piece of cake'. Computerised diet records require users to enter a portion size from a list of options, such as grams or measuring cups/spoons. This function ensures that useful measures are recorded for use in the analysis of the diet, but may not be accurate if the participant estimates amounts inaccurately or if appropriate measuring options are not provided.

Of the computerised dietary analysis tools currently available, there are a variety of formats, including diet records, diet histories, 24 hour diet recalls and food frequency questionnaires (Probst & Tapsell 2004). Each has a number of advantages and disadvantages for gathering the information necessary to perform an accurate assessment of the subject's diet. Food frequency questionnaires are simple to use, and place little burden on the patient (Matthys *et al.* 2007). However, they may have only a small range of standard portion sizes (Matthys *et al.* 2007), and are limited by their inability to provide accurately quantified information (Vereecken *et al.* 2005). Diet histories and 24 hour diet recalls require skilled interviewers to gather accurate information (Vereecken *et al.* 2005; Probst *et al.* 2005). They are also limited by the memory of the subject, and 24 hour recalls may not be an accurate representation of the subject's typical diet.

The weighed and estimated food record is considered to be the 'gold standard' of dietary assessment, used as the standard of comparison for other methods (Vereecken *et al.* 2005). It has a number of distinct advantages, including its use in accurately quantifying portion sizes of food, and that unlike many other methods, the food record does not rely on memory (Vereecken *et al.* 2005). It does however have some disadvantages. In particular, it is common for people to modify their food intake when keeping a food record (Vereecken *et al.* 2005). This may be due to the complication of weighing and measuring food, or due to the participant's reluctance to record a true representation of their diet. As with all dietary assessment tools, food records rely on the accuracy of the respondent's report (Vereecken *et al.* 2005). Computerised diet records, where the patient enters the data directly into the system, may have some advantages over the traditional written food record. They minimise the likelihood of transcription errors occurring, as the data is not being transcribed from one source to another as it would in a hand-written record being analysed by a computer (Kos & Batig 1996). Computerised food diaries also have the benefits of quick and easy data processing and improved compliance (Kos & Batig 1996). Importantly, most subjects appear to enjoy keeping their food record on a computer (Kos & Batig 1996; Heetderks-Cox 2001; Painter & Sabbert 2001). This may be important in determining patient compliance with keeping the diary in a clinical situation.

Most programs are designed to target the dietitian or other health professional as the key user, with data being entered into the computer following a traditional diet history interview (Probst & Tapsell 2004). Of the computer programs that use complete automation, limitations were identified with food portion size and the ability of the patient to use the program (Probst & Tapsell 2004). These programs are generally not intended to replace the role of the dietitian in providing individualised nutrition counselling and advice. The skills and experience of a dietitian are important to ensuring that the results of the nutrition analyses are interpreted and understood correctly, to avoid misuse of these tools (Peregrin 2001). The participants in the study conducted by Heetderks-Cox *et al.* (2001) recognised this, stating that assistance from a dietitian would be helpful for more customised advice, assessment and assistance achieving and maintaining dietary change.

Methods

Ethics

Ethics approval was sought from the Ethics Review Committee of the Central Sydney Area Health Service (RPAH Zone), and the Charles Sturt University Ethics Committee.

Participant Recruitment

Participants were patients or parents of patients at the RPAH Allergy Clinic. Participants were randomly approached and recruited from the waiting room of the clinic to participate in the interview on the same day. Verbal consent to take part in the research and to have the interview digitally recorded was obtained from each participant. Participants included both new patients and patients returning to the clinic for review.

Study Design

The study was conducted using the qualitative research method of in-depth interviews. In-depth interviews are used to explore the opinions of participants about a topic (PRA 2006). They are a focused conversation about an issue in used to gather information (PRA 2006). Interviews were conducted at the clinic by a fourth year student dietitian. Prior to the interview, basic demographic information was collected about the participants. The interview structure for this study involved asking participants to use and provide feedback about two free internet-based dietary record programs, *Calorie King*, (CK; www.calorieking.com.au) and *Formula for Life*, (FFL; www.formulaforlife.com.au). A brief explanation of how to use each website was provided by the interviewer, and additional features of the programs highlighted as appropriate. This was followed by a discussion of the participant's thoughts about the programs and the use of internet based dietary records. The outline of the questions used in the interview, including possible probing questions and the forms used in the interviews, can be found in Appendix A. Topics included general comments on each of the programs, the purpose of dietary analysis programs, advantages and disadvantages to using the programs, and good and bad features of the programs used in the interviews. The in-depth interviews were conducted over a period of four weeks until saturation of data was achieved.

Data Analysis

Each interview was recorded and transcribed. A coding frame was developed (Appendix B), and the data was coded manually and analysed using thematic and content analysis techniques.

Results

Participants

A total of 15 interviews were conducted, involving 17 participants. The participants ranged in age from 20 to 51 years old, with a mean of 35 years. The age of the patients attending the allergy clinic ranged from 10 months to 51 years. Five males and 12 females were interviewed. Of the 15 interviews, 10 participants had access to a computer at both home and work, and five had access at home only. Most participants were confident using computers; nine participants rated themselves as 'very confident', five were 'confident', one rated herself as 'ok' and two participants rated themselves as 'uncomfortable' using computers. Only four participants reported having completed a food record in the past. A summary of the demographic data can be found in Appendix C.

Categories of Data

The data attained from the in-depth interviews was organised into the following categories:

1. Comments on *Calorie King Online*
 - 1.1 Problems with use
 - 1.2 Dietary feedback provided by program
 - 1.3 Difficulty/ease of use
 - 1.4 Food databases and searching
 - 1.5 Format of program
 - 1.6 Extra features of program
2. Comments on *Formula for Life*
 - 2.1 Problems with use
 - 2.2 Dietary feedback provided by program
 - 2.3 Difficulty/ease of use
 - 2.4 Food databases and searching
 - 2.5 Format of program
 - 2.6 Extra features of program
 - 2.7 Suggestions for improvement
3. Purpose of the Programs
 - 3.1 Nutritional adequacy
 - 3.2 Access at home

- 3.3 Managing health
- 3.4 Meal planning
- 3.5 Increased awareness of intake
- 3.6 Education
- 3.7 Allergy and Intolerance

- 4. Advantages and Disadvantages of keeping a Food Record in this way
 - 4.1 Avoid travel
 - 4.2 Nutritional information
 - 4.3 Convenience/time
 - 4.4 Comparison to written record
 - 4.5 Computer access/skill

- 5. What is Good and Not so Good about the Programs
 - 5.1 Entering foods into record
 - 5.2 Nutrition feedback
 - 5.3 Extra features
 - 5.4 Suggested changes
 - 5.5 Format of screen

- 6. Other Comments
 - 6.1 Meal or time of day
 - 6.2 Cost
 - 6.3 Attitude to the program

Discussion

The aim of in-depth interviews is to gain a better understanding of an issue from the perspective of the participants (PRA 2006). This study sought to explore the attitudes and opinions of patients at the RPAH Allergy Clinic to using a web application to keep a diet record. Discussion included an exploration of the features of *Calorie King* (CK) and *Formula for Life* (FFL), as well as the purpose, advantages and disadvantages of the programs, in order to assist with the development of a program that patients will find easy and convenient to use. The various issues arising from the interviews are discussed below.

1. Comments on *Calorie King Online*

As participants explored the web applications used in the interviews, they commented on various aspects of the program. Analysis of the interview transcripts revealed several major areas participants commented on, each providing insight into how participants perceived the program and how various features were received.

1.1 Problems with Use:

A number of difficulties occurred when participants trialed CK. These were revealed in both comments made by the participant while using the program, and in observations made by the interviewer of where the participant had difficulty.

Many participants struggled to enter in the correct portion size for a selected food item. This occurred for a number of reasons. Some participants did not find the program intuitive to use. They often did not realise that other portion sizes could be found in the drop-down box, and became confused if the first suggestion was not what they wanted. Many participants also failed to notice the area provided for number of servings, and did not change this option to fit their intake. Other participants entered the amount of an ingredient used in a recipe, rather than the individual portion eaten. This could perhaps be overcome by including a function for entering a recipe for analysis, including the number of servings produced by the recipe.

“The only thing I would say is like here where I’ve got the entire carton of cream, you have to make sure you estimate your portion of things, which is obviously where I’ve gone wrong there.”

Participant 12

Participants also had trouble estimating the actual portion size eaten, a problem common in self-reported dietary intake (Probst and Tapsell 2004). Participants tended to take the program's suggestion of a 'serving' (often based on the manufacturer's suggestion) rather than estimating the amount they have eaten. This makes it difficult to obtain an accurate analysis of the patient's intake, potentially even promoting unnecessary dietary changes if an incorrect analysis of the diet is applied without dietetic advice. It is important that the program is able to prompt patients to enter in appropriate portion sizes.

"How do you explain 400g? I mean, he would eat about that high, and he would eat that much [indicates with hands]. So do you think that would be 400g?"

Participant 14

Another problem encountered by participants was difficulty with spelling, which will create problems if the participant immediately assumed the food was not in the database when a search with incorrect spelling yielded no results. This may not be as significant when the food record is being kept at home, where the participant has access to food packages. It was also very common for participants to forget to add milk to cereal, and a number of participants were not sure if drinks are included with foods on a diet record. A lack of food knowledge could also lead to inaccurate food entry- for example, one participant entered two minute noodles as boiled rather than fried.

1.2 Dietary Feedback provided by Program

The format of nutritional feedback provided by CK consists of a basic nutritional breakdown of each food, meal and daily total. This consists of the numerical amount of energy, protein, carbohydrate, sugars, fat and calcium (the nutrients reported can be changed if desired). In addition, bars at the bottom of the page indicate how much of the person's daily allowance for each nutrient has been filled. Participants varied in their response to this data. Most reacted well to the bars indicating the proportion of their recommended intake that has been achieved, although some found it difficult to interpret. Participants generally seemed to prefer the visual representation of the bars rather than the numerical feedback, which was seen as more difficult to understand.

"I think I'd be better at understanding the line thing...I think they'd be easier for younger people too probably."

Participant 15

"I like the way it tells you how much you've used over your daily usage, how it breaks down the percentage of fats, proteins, carbs, it's very interesting."

Participant 3

1.3 Difficulty/Ease of Use

In general, the participants found CK reasonably user-friendly and easy to use. During the interview, they were guided with initial instructions, but most were quickly able to understand how to use the program. Potential difficulties suggested by the participants included problems with typing skills or literacy. Some participants found the process of entering foods to be long and frustrating.

"It's fairly easy, and I think once you've got it set up the once, you would be much quicker at using it next time, you'd know where to find things, and also when you're doing it at home you'll have your brands and sizes there."

Participant 12

"It's just time consuming and just, yeah, just I think once you used it a lot more it would be ok."

Participant 1

1.4 Food Databases and Searching

Participants in the study were generally able to use the search mechanism on CK without major difficulty. Participants appreciated having a large selection of common brands in the database, as they were able to recognise and choose the exact food they wanted easily. This is especially the case for participants with less knowledge of food products, who are more easily able to recognise familiar names than a description of the food content. Although ingredients can be entered separately to make up a homemade meal, many participants instead chose from the pre-prepared choices.

"They have a lot more than I would have thought of, because we eat some pretty unusual brands."

Participant 15

"Because I don't buy a lot of the- because I make a lot of stuff myself, so... all that stuff from the supermarket, then they're targeting that, and it's not what I would buy."

Participant 7

Participants tended to look at the top of the search results only, and did not like searching through a long list of results to find the food they were looking for. One participant suggested having a separate search with only foods allowed on the elimination diet to choose from, as a means of narrowing the results. Other searches produced irrelevant results, such as producing a long list of Starbucks coffee with cream as the first results in a search for 'cream'.

"A few of the food options took me a while to find; Diet Coke for instance. Maybe if you could break them up more. So, when I search in here, maybe have a group type, as well as a search field. Whether it's breakfast foods, whether it's drinks, or cereals, or milk products, dairy products or something."

Participant 8

"You could have tabs there where you could put foods for the elimination diet that you could pick from. So then it actually limits your choices."

Participant 11

1.5 Format of the Program

Calorie King Online has the option of two different formats, described as 'Old Style' and 'New Style', with New Style being the default format. Participants in the study were divided over which was the better style. All participants wanted a screen that is simple or clear, an observation also noted by Probst *et al.* (2005). Participants who preferred the old style commented on the tick boxes making it easier to change mistakes, and the screen being clearer without the search panel on the side. Others found the new layout to be simpler.

1.6 Extra Features of Program

In addition to the basic diet entry function, CK has a number of additional features. These include saving meals, entering new foods, and developing a 'favourite foods' list of commonly eaten foods. These features were generally not noticed by participants unless they were pointed out. This may be a consequence of the layout of the screen, or from the fact that participants were only trialling the program rather than using it for a number of days. Participants appeared to like the idea of being able to set aside favourite foods, and several enquired about how to enter a food that is not on the database, indicating that they felt this would be a necessary feature.

“The favourites would be handy, especially on the elimination diet, because you tend to be repeating a lot of the time.”

Participant 11

“[Adding a new food] is good because we’re such a multicultural society there’s some foods that may not be [in the database].”

Participant 9

2. Comments on *Formula for Life*

Participants also made comments as they used FFL. Overall, most participants did not like FFL as much as CK, although some preferred it. The comments made about this program fell into similar categories to those made about CK, and are elaborated below.

2.1 Problems with Use

Similar problems to CK were encountered with FFL regarding the estimation of portion size. In addition, FFL includes a ‘calculate’ function, where users can calculate the nutrition information for their food selection before adding it to their meal. This tended to confuse participants, as they did not immediately see where to add the food to their meal, because the button is located at the bottom of the screen. Another difficulty several participants had was beginning the search; the ‘add button’ used to enter into a meal was not clear, and caused some confusion. It also frustrated participants to have to keep changing page to add foods to their record. A better design may be to have both the search and meals on the same page, as is the case with CK, or to be able to select multiple foods at once.

2.2 Dietary Feedback Provided by Program

FFL provides two bar graphs, showing how the food group and nutrition requirements have been met for the day, using a perpendicular bar to indicate the recommended intake level. Written recommendations can also be viewed, including suggestions about how to increase the intake of nutrients that were below recommended levels. The percentage of the requirement of each nutrient is also calculated, but is not displayed, and most participants could not find out how to view this information; several commented that they would like to have a numerical value.

The idea of a graphical representation of the nutrition analysis was liked by many; however some participants found the graph difficult to interpret. For example, they did not know what the line for

the recommended level of nutrients indicated. The design of the graph also implies that equal amounts of each food group or nutrient are required. This could be improved by using a different type of graph.

"I think most mums would have it in the back of their minds to at least look at some of this stuff- calcium you look at, fibre you look at, but some of the other ones you don't really know what they've got to be having and how much, so that's quite good."

Participant 5

"I preferred to have the figures rather than just a little graph. So here to see my energy value I have to actually click on it...So I've had two different pages and about 10 seconds just to find out how much energy I've had."

Participant 8

2.3 Difficulty/Ease of Use

Participants who did not like FFL tended to strongly dislike it, abandoning it quite quickly. A number of comments were made about the difficulty of finding the desired food, and on the layout of the program. Some participants found FFL quicker to use than CK, as less typing was required; foods could be chosen from a list. However, these participants tended to select foods that were pre-prepared meals included on the site, and which may not be an accurate reflection of their own homemade meals. Participants who attempted to enter foods in accurately found the program more time consuming, and recognised the need to find out the contents of some packaged foods.

"I think you'd need a bit longer to play on this one to understand what you should do and stuff. It's not quite as easy as the other one, because you can't just type in."

Participant 15

"This one's quicker to do than the other one. Because it's really pressing the button. So you could put something in that's close to what you may have if it wasn't there exactly."

Participant 9

"You've sort of got to go around it in a funny way. So people who aren't as confident with the internet would probably find it quite difficult."

Participant 11

2.4 Food Databases and Searching

As indicated above, the searching function of FFL presents a number of difficulties, which should be avoided in the development of a new program. FFL does not include brand names of manufactured products in its database, which many participants found frustrating. Some gave up searching immediately, while others chose from the list of choices provided.

"This one's harder to find- there seems to be a lot more information... I can't find Weet Bix in there, so if we're going to be specific... I have no idea what's in the food I'm buying."

Participant 2

"I think [CK] was easier because it actually listed some brands, some familiar brands that you buy every day. I think it's easier for it to be calculated... I think it's more time consuming this way, because you've got to go away and look at the pack- if you're going to do this as accurately as possible. I don't think this would be very beneficial if you weren't confident with what you'd put in and were still doubting."

Participant 5

An aspect of the search on FFL appreciated by a number of participants was the option of searching for foods by category, as well as having the general search. However, the layout of the search results was found to be confusing, as many patients found it difficult to search through the long list of foods presented in each category. Despite these lists of food items and meals, FFL has quite a limited range of products in its database, making it difficult for participants to locate a food that reflects their intake.

"I don't think it's as accurate if you know what I mean, because it already spells out what things are, whereas with the other one [CK] you've got more options."

Participant 12

2.5 Format of the Program

Most participants found FFL quite cumbersome to use. In particular, the large amount of small text was seen as a problem, revealing a preference for a clearer screen. Some participants noticed that it takes longer to find information on FFL, as the page is reloaded with each selection made. While some participants liked having food group categories, others found them confusing, possibly as a result of the way they are laid out on the page, which is quite close together with small, underlined font.

"I don't like this layout as much, this [food categories] is a bit confusing, and the way the links are all underlined...it would take longer to navigate this I think."

Participant 2

2.6 Extra Features of the Program

FFL has a number of features that participants found useful, and which should be considered in the development of a food record program. Popular features included the 'Accompaniments' feature, which lists suggestions of foods to pair with a selected food item, the 'Recent Foods' area, which separates foods used recently so they can be accessed easily, and the 'My Meals' feature, which enables the user to save a meal to use again. These features are designed to make searching for foods and filling in the record quicker and easier, which is important if the record is to be filled in over a long period of time. Participants also enjoyed seeing the recommendations for improvements to their diet; ideally, in the program developed for use at the Allergy Unit, this would come directly from interaction between the patient and the dietitian.

"I do however like this [accompaniments] on the side, so you can- it's obviously going to be quicker to pick things that go with it."

Participant 12

"[Recent Foods] is quite good, because some things like the coffee you'd have on a daily basis, so you can always go and grab that which is good."

Participant 12

2.7 Suggestions for Improvement

During the discussion of FFL, a number of participants made suggestions of possible ways to make the program easier to use or better suited to their needs. These are potentially useful for

consideration in the design of future programs. Some suggestions were to make the construction of a meal easier by making it possible to add several foods together, such as adding all the vegetables in a meal at the same time or adding sandwich fillings from a list. Another useful suggestion was for the inclusion of subcategories to search results, in order to avoid having a long list of choices within each food group.

“[The food group categories] would be ok if it’s under vegetables and I’m able to choose five of them...rather than having to go back and forth.”

Interview 1

3. Purpose of the Program

Participants in the study generally had a positive attitude to the idea of the web-based diet record and nutrition analysis program. This reflects the findings of previous studies (Heetderks-Cox *et al.* 2001; Painter & Sabbert 2001; Kos & Batig 1996). They identified a number of purposes for the program, and a number expressed interest in using a program in the future. The main objectives of the program identified by participants are discussed below.

3.1 Nutritional Adequacy

The primary reason for the program stated by most participants was to monitor and ensure the nutritional adequacy of the diet. Parents seemed particularly interested in this benefit, expressing concern over whether their child receives a balanced diet or enough nutrition, especially if they are on the elimination diet. This is one of the great benefits of using such a program at the Allergy Clinic, provided the nutritional information is correctly interpreted, because it has the potential to provide parents with the reassurance that their child is not being malnourished while following a strict diet, and allows the dietitian to objectively demonstrate to the patient where the nutritional requirements are being met. In the case of a diet that is inadequate, the dietitian is again equipped with a tool to visually make the problem clear to the patient. This may also provide the patient with motivation to improve their diet. In a context such as the Allergy Unit where nutritional supplements and formulas are used frequently, it would be important to include the ability to include these products as a part of the diet on the computer program to obtain a complete picture of the individual’s nutritional status.

“If you were really looking at your diet I guess it would give you a really complex look at it. Taking everything down so you knew what you were lacking...It’s nice to know if you’re eating too much or not enough or something.

Participant 7

“Because I always worry about, because he doesn’t eat, he’d be lucky if he has a small piece of red meat a week. And we’re not onto fish yet...A little bit of chicken, but again, we’d be lucky if it was that much. I always worry whether he’s getting a decent balance and enough.”

Participant 14

3.2 Access at Home

Participants recognised that an internet based program accessed by both dietitian and patient may allow them to make fewer visits to the clinic. This was particularly appreciated by participants who live in country areas.

“It’s good for us because we’re so far from town, seeing the dietitian is difficult...it’s good because that way we’ve done all this and we don’t have to come down, because it’s a lot for us even to get organised to come down.”

Participant 15

3.3 Managing Health

Although the web-application is to be developed by the Allergy Unit, participants in the study recognised the wider dietetic applications of such a program in the management of other diet-related diseases, such as diabetes and overweight/obesity. This is a pertinent issue, as the incidence and prevalence of these diseases is increasing in Australia (Diabetes Australia 2007), and the production of tools to assist in their management can only be a positive step in the fight against them.

“...I’d probably use it for people with weight, maybe diabetes, sugar levels, fat levels, cholesterol, that sort of thing. Helping you maybe manage your own diet and your health a bit better.”

Participant 14

"If you're putting everything in, even the bad stuff, it probably shows you, it's probably something you don't want to put in."

Participant 7

3.4 Meal Planning

The web-application is intended to be a retrospective record of dietary intake. However, one participant felt that it would also be useful in planning healthy meals for the week, to ensure an adequate intake of different nutrients.

"I also think it would be handy just to use at home...you could have a bit of a think about, maybe during the week, what you had to make up and what you didn't, and whether he's getting a good balance."

Participant 14

3.5 Increased Awareness of Intake

Participants commented that the act of keeping the food record would increase their awareness of what they, or their child, eat, which was also noticed by Oenema, Brug and Lechner (2001). This has advantages for improving motivation for change for conditions such as diabetes and obesity, as the patient can see where they need to change (Oenema, Brug and Lechner 2001). For both children and adults, keeping the diary may highlight areas they are eating the wrong foods for their condition (for example, foods high in salicylate or another chemical), which may help in the management of associated symptoms.

"When she's not with me, when she's at family day care, just to make sure the person tells me what she is eating, she might be picking up stuff she's not meant to be having there."

Participant 9

3.6 Education

Participants in the study felt that the programs they viewed were informative, and that they would be useful for teaching them about nutrition. This may help increase the awareness and knowledge of good nutrition amongst people using the program, increasing the overall health of the patient and their family if used appropriately.

“I think if you’re doubting what you’re eating, or if you’re not sure, or you don’t know enough about what nutrients you should be eating, one, you learn from it, two, you know how much of it you need, and then you have the opportunity to compare what you eat...I think it’s a great guide, because it teaches you what you need to be eating and lets you know if you’re eating enough or not enough of it.”

Participant 5

3.7 Allergy and Intolerance

As all of the participants in the study were patients or parents of patients at the Allergy Unit, several participants commented on the use of the application for people with food allergy or intolerance. This included both seeking reassurance and feedback on the adequacy of nutritional intake while on the elimination diet, and also as a tool in linking symptoms or reactions to the food or chemical that caused the problem. Future additions to the program developed by the Allergy Unit may include a symptom diary that can be used alongside the food record, in order to compare the two more easily.

“If she has any allergies, if she does have a reaction, being able to look at her day and see how she’s got through the day, if there’s any common food I suppose, so you can tell each time she’s had some sort of reaction.”

Participant 4

4. Advantages and Disadvantages of keeping a Web-Based Food Record

Each participant was asked to comment on the advantages and disadvantages of keeping a food record on the internet. This produced a range of responses, which were largely positive, as most participants identified more advantages than disadvantages to using the program. The following are the categories of advantages and disadvantages raised by participants during the interviews.

4.1 Avoid Travel

At least three of the participants interviewed lived outside Sydney, including two living in rural NSW. These participants felt that using the internet to keep their diet record would enable them to travel to the clinic less frequently, which was seen to be a positive result of using the program. It must be made clear that the program is not intended to be a replacement for personal consultation with a dietitian, but it is a tool to assist both the dietitian and the patients to manage their nutrition.

“The advantage would be we’d be able to just do it, we wouldn’t have to travel all the way down here maybe all the time.”

Participant 15

4.2 Nutritional Information

Participants were generally very interested in the nutritional feedback provided by the programs they viewed during the interview, and reported finding the information to be helpful. Receiving instant feedback from the program, rather than having to wait until a diet review appointment could be made, was also seen to be an advantage, as noted in the study by Probst *et al.* (2005). Several participants praised the ability of the computer to calculate their nutritional needs for them, comparing it to using calorie-counting books on their own. Other aspects of the nutritional feedback that received positive comments from participants were the educational benefit of learning what they should be eating and which foods to obtain different nutrients from, and seeing where they have achieved nutrition targets.

“I think it would be helpful to see what you’ve done right, but also maybe as a bit of a mind jogger as to where you’ve gone wrong.”

Participant 14

Participants also felt that using the diary would be a useful way to increase their awareness of the nutritional value of their dietary intake, or that of their children. They commented that this may lead to some changes, indicating that such a program may be able assist in motivating people to achieve healthier diets.

“The disadvantages would be that I would see that I was very unhealthy! But I’d be able obviously to clean up my act.”

Participant 3

“It would be a bit of an eye-opener I think. And it might end up leading to some changes.”

Participant 4

4.3 Convenience/Time

Participants responded both positively and negatively when commenting on the convenience of using the programs. It appears to depend on the individual lifestyle and computer usage; people who use the computer often were more inclined to think that the program would be efficient to use. The majority of participants thought the program would be quick to use, especially once the habit of keeping the record was established. One participant pointed out that older children would be able to keep the diary themselves, and felt that her daughter would enjoy doing it. Features that could save time while entering food into the diary, such as being able to save a meal, received positive comments.

"It was reasonably quick to put the stuff in that he eats, I suppose because he doesn't have a huge repertoire of foods, so it wasn't. If you were going into the whole things as to breaking up of what was in the lasagne, all those bits, then maybe it would be more time consuming, but... you put it in once and then save it as your favourite food, then it's done, isn't it?"

Participant 14

"Time's an issue, especially, we're moving house and everything at the moment too, but saying that I think it would be easy enough to quickly jump on the computer and do it."

Participant 4

Other participants, particularly those who did not use the computer throughout the day, tended to think it would not be a convenient way to record food intake.

"I think it's a lot of work, to actually get on and put everything in, but if it was something I had to do, I'd do it, but I would find it time-consuming."

Participant 7

4.4 Comparison to Written Record

When comparing the computerised food record to keeping a written record, most respondents commented in favour of the computerised system. Participants felt that it was both faster and easier to keep the record on the computer. They also favoured the way that the computer automatically

calculates the nutritional adequacy of the diet, providing instant feedback that is not possible with a written diary. Practical advantages were also identified, including that an internet based record cannot be accidentally lost, that it must be complete, and that it is more attractive to do each day because it looks clearer and tidier.

"It's just easier I think than actually writing everything down. With everything in my life I usually have my computer on, you know, the internet anyway. I suppose the other thing is that if it's online you'd be able to do it straight away, from home or at work or wherever you are."

Participant 3

"This is more attractive to do, rather than having a book where you've got to go and find a pen that works, I know that seems really trivial, but this is all neat and set out nicely and I all clicks up for you. You don't have to go and find the book...You know it's the only computer, you know that's where the record is, it's not stuck in the papers somewhere or thrown out with the garbage."

Participant 11

However, some responses were in favour of written food records. The main reason for preferring a written record was a lack of confidence using computers. Some participants also mentioned that they would write the foods eaten in a written diary throughout the day and enter it onto the computer at night; some did not think this was a problem, while others thought that to be inconvenient. Even participants who would prefer to use a written diary recognised the benefits of the computerised record in providing dietary feedback.

"I would probably find it easier to just write something down, I'm not really a computer person. So for me it would probably be quicker. I guess the advantage of this is it's all stored and it actually calculates everything for you, but for me it would just be time-consuming because you'd have to get on here and do it."

Participant 7

"I wouldn't be able to do it real easy; I'd prefer just to write it down on a bit of paper."

Participant 13

4.5 Computer Access/Skill

Despite the recognised advantages of using a computer rather than a written record, many participants also noted the potential disadvantages to using technology. Access to the internet was understood to be a problem for some patients, in absolute terms in some country areas as well as for individuals who do not have access to a computer throughout the day. The computer literacy of the user was also considered, with participants recognising that difficulties may be encountered by people lacking computer skills. Conversely, those who spend a large amount of time using computers felt that it would be an advantage to them to use an internet based record.

“I suppose a disadvantage would be you’d have to make sure you can get the program. You know, access it through the internet or whatever...I’m thinking because the last couple of weeks my computer’s been doing funny things. And it’s through the internet, so you’d want to make sure that’s working well.”

Participant 9

“We’ve only really had the internet recently, before, we would have struggled doing this, living outside a major city where the internet access is not...especially if you have dial up, which we don’t, but there are still areas that have dial up and you’d be sitting there for hours.”

Participant 11

5. What is Good and Not So Good about the Programs

Participants were asked to comment on features of the program that they liked and did not like, in order to discover the features and characteristics they found to be useful, as well as aspects of the programs that did not work well.

5.1 Entering Foods into Record

Entering foods from the database into the food record is a key function of the diet record programs, so it is essential that they work effectively and are easy to use. An area that many participants commented on was the nature of the database, and in particular whether it includes familiar brand name products. A number of participants felt that entering the correct brand would result in a more accurate dietary analysis, and liked being able to enter a ‘custom food’ using the nutrition information panel. This is a useful point to make, as there can be significant variation in the nutritional content between brands of many types of food. Some participants found that the

database used on FFL was too limited, making it difficult to accurately enter foods. This was especially the case when more unusual food products were used, but a similar problem occurred for participants wanting to find plain, single foods, as many of the meals listed in each category are meals that are already made up. This highlights the need for a thorough and extensive database, especially for a program used by the Allergy Unit, where patients are more likely to be using foods that are uncommon.

“So it’s not a true reflection of what I eat.”

Participant 11

“I know multigrain breads can vary a lot, with calories and all that...and that might not be the same as the bread you use yourself...That kind of gives you a misleading indication of how much you’re consuming of that, that’s the only thing. Because it’s not specific to that brand or something.”

Participant 7

“Actually with this one [FFL] it was a bit hard to find just a simple meal, there was a lot of things with it. With just anaphylactic people tend to eat pretty basic and then they add their stuff with it.”

Participant 15

Another aspect of searching for and entering foods that participants commented on was the method of the search function. The major differences between the two programs used in the study commented on by participants was the amount of typing involved in the search process, and the division of foods into categories. Participants, particularly if they had difficulty spelling, liked being able to choose a food or meal from a range of categories. Although some participants felt that a search function requiring less typing was easier to use, it does make it difficult to specify the exact food eaten. The selected foods may not be a true reflection of the person’s intake, rendering the dietary analysis useless.

“I prefer that, the way you can go in here and don’t have to type it in, you can go into a category and you’re more likely to get something. So even spelling things on the other one, if you can’t quite spell it right you wouldn’t find it.”

Participant 13

Considerations when designing a search function to be user-friendly would include having both generic and brand name items in the database, and having an intuitive way to enter a recipe for a homemade meal. Problems occur when a dish such as 'lasagne' is typed into the search instead of individual ingredients, as manufactured or 'standard' products are produced by the database. Participants did not seem to recognise that even the 'homemade' lasagne on the search results is unlikely to be the same as the recipe they use at home and were generally inclined to choose something from the list. Difficulty spelling was also a common problem, which needs to be considered in the design of the search function of the program.

5.2 Nutrition Feedback

The majority of participants responded very positively to the nutritional feedback provided by the program. Most found it to be interesting and informative, and liked the idea of receiving instant feedback about their diet. Participants varied in the amount of information they wanted; some wanted numerical information on each nutrient, while others were satisfied with a simple indication of whether they were on the right track. The graphical presentation of nutrients on FFL was popular, but may be made clearer by including a numerical value or percentage of recommended dietary intake, as some participants found it difficult to understand. It is important that any feedback provided to participants is easy to understand and that it is interpreted with the assistance of a dietitian, in order to avoid misunderstandings and inappropriate dietary modification (Peregrin 2001).

"I think that was useful...the saying if you're under or over. It's good because you want to make sure you're giving your child the recommended amounts."

Participant 9

"I like this little bit down the bottom [information on CK], it's simple, it's effective, whereas the other one tended to go into all the different vitamins and things as well. Some people think that's really good, some people know all about that stuff."

Participant 14

"I quite like this here [nutrient graph]. I mean, again I don't know what any of it means at this stage, but I think it's quite good. And I like that too, it tells you when you click on it or hold it over what- like, 82% of your recommended intake... good when you're really trying to get a handle on things."

Participant 4

5.3 Extra Features

The extra features of CK and FFL are aim to make food entry into the record faster and easier. Participants were in favour of these features. They particularly commented on being able to save a meal to use again in subsequent entries, and having an 'Accompaniments' feature, as seen on FFL, to make it easier to enter foods together. This could also be helpful in improving the completeness of the food records, as it may help participants to remember to add milk to cereal, butter to bread, and so on. Participants also liked having a 'recent foods' or 'favourite foods' feature, as these allow them to quickly access foods that are used commonly. This also addresses the concern of a number of patients over having such as large search results list; once the usual foods have been entered, general searches would not be required as often. The ability to save a meal could be applied to both recipes and meals, making keeping the diet record more efficient.

"I think the accompaniments down the side are very good, so you don't have to go back and type them in or pick from a list, you can just tick boxes of what was in there, it's a very good option."

Participant 11

"Being able to save a meal, especially like banana sandwiches or something would be good because you wouldn't have to go through and look it up each time and have to find it."

Participant 15

"I like the recent foods on the side, because it means again you can just go and grab it. Most people are pretty regular in what they have, aren't they?"

Participant 12

Other features of the programs appreciated by the participants are designed to improve the accuracy of meal entry and the resulting dietary analysis. Several participants noticed the activity record, recognising that this would have an effect on their energy requirements. The ability to enter new foods using the nutrition information panel was also important to a number of participants. In the context of the Allergy Unit, this may be particularly important. Many patients use uncommon food products, such as gluten free grains, which may not appear in the database and would require manual entry, especially over time as new products are developed.

“This one’s good, but it doesn’t have the add-on [to add in new foods], because there’s so many nationalities and they eat different things, it might be a bit biased, how it’s added up.”

Participant 9

5.4 Suggested Changes

In addition to commenting on what they liked and did not like about the programs, several participants suggested changes that could be made to improve them. These changes can be taken into consideration for the program to be developed by the Allergy Unit. Some changes may be viewed as a ‘wish list’ of ideal features, which may or may not be included after the program is operational. These include growth charts for children, suggested menus and portion sizes for babies, as well as links to read more information about symptoms.

Other suggestions, however, were more practical, and may be of use in the program’s basic design. Submenus were suggested to make searching for specific foods simpler, as it would reduce the size of the list of search results. The name of the features of the program needs to be considered carefully, in order to make them self-explanatory. Participants also suggested using a larger font and making use of the whole screen to make the page clearer. It was also suggested that the program include lists of foods that are low, moderate and high in chemical load.

“Say under vegetables you’ve got 20 vegetables, would it be easier to just click on potatoes, and then under potatoes a submenu comes up with baked, boiled, mashed, as opposed to having ‘potato, baked’, because it just takes longer to read than if you just think ‘potato’, click on potato, next, under potato you’ve got how many ways to cook it...instead of having to read every single line.”

Participant 12

5.5 Format of Screen

The layout of the page could have an impact on the participant’s opinion of the program. Participants tended to prefer the screen to be less cluttered, which would be improved by using the whole screen rather than a small portion of it. They also preferred all the information to be on one page, avoiding changing from one page to another to view information or add foods, as this is easier to navigate.

“With the second one you had to click on different pages to get different things, whereas the other one was sort of simpler to have it all on one page.”

Participant 10

“It’s a bit wordy. People from my own experience [as a software engineer] aren’t going to sit there and read it. From my own experience, if they can’t work it out by pointing at a few buttons, they’ll stop using it... It’s probably partly to do with it being half the size [screen]; the text is actually quite small; so it does look a little cramped.”

Participant 8

6. Other Comments

Participants made a number of other comments about the use of the food record programs.

6.1 Meal or Time of Day

Most participants who commented on the layout of the record by meals and snacks versus time of day thought they would prefer to use the meal and snack format rather than time of day. Some saw advantages to recording the time of day.

“[Meal by meal] is good, otherwise it gets too confusing. Basically we do breakfast, lunch and dinner and snacks, so yeah, I think that’s easy.”

Participant 11

“I suppose if you wanted details of what you’re eating exactly when, then yeah, you could probably break it into one hour blocks or half hour blocks would probably work, but if you just want to know what you had for lunch, dinner and tea, then this works as well.”

Participant 3

6.2 Cost

A number of participants enquired about the cost of using web-based diet records. One participant commented that she would be willing to pay for the online support of a dietitian.

6.3 Attitude to the Program

The overall response to the programs was encouraging. Most participants were positive about the idea of using a web-based diet record, in general as well as for the purpose of the Allergy Unit. Some commented that they would consider trying it out at home, or telling friends or family about the tools.

“My husband would probably be interested; he reads all the food labels and everything.”

Participant 7

“I think it’s a great idea actually, especially for communication reasons and that type of thing, it’s better communication.”

Participant 1

Limitations

There are a number of considerations that must be considered when applying the results of this study. The interviews were conducted with a sample of patients from the RPAH Allergy Unit clinic, and so may not be generalised to the wider population. As the interviews were conducted with patients approached in the waiting room of the clinic, some interviews were time-pressured, enabling participants only a short trial of each program. Responses may be different if participants were given more time to explore the websites.

Recommendations

Based on the interviews conducted and described in this study, the following recommendations can be made for the development of the web-based diet record by the RPAH Allergy Unit:

Food Entry

- Portion size estimation must be clear, possibly using a combination of familiar kitchen measurements (measuring cups or spoons), measured weights or using the standard size of products (eg. slice of bread, tub of yoghurt, medium carrot, manufacturer's suggestion, etc).
- It should be possible to enter a recipe, to allow homemade meals to be used in the program. This should include a number of servings per recipe in order to obtain nutrition information per serve.
- The program should have a function to manage spelling and typing errors; patients should be instructed to keep food packages for reference when keeping the record.
- A broad database is required by patients of the Allergy Unit, including a wide range of familiar brands as well as fresh and generic products.
- It should be possible for users to add new foods to the database.
- Drinks should be included as a category to ensure they are included in the record.
- Supplements should be included on the database or elsewhere in the program, as these contribute to the patient's nutritional intake.
- Inclusion of pre-prepared meals (such as 'lasagne', without a brand name) should be avoided in the database unless prompted to include ingredients or further specified if the food entry is to be accurate (eg. 'lasagne, with mince and cheese sauce' or lasagne, 'vegetarian, no cheese sauce', etc; however, this may be confusing to users with little food knowledge).
- Features to make food entry into the record more efficient, such as setting aside favourite or recently used foods from the general search and suggesting foods commonly paired together are very useful, provided they are made clear and are simple to use.
- Search results need to be logical, listed according to similarity to the search keyword, in order to make the desired product easy to find. Program users are unlikely to search through a long list of results, indicating that a means of narrowing the search or including sub-categories may be useful.
- It would be helpful to include a 'prompting' system to remind users to add condiments and to complete their meal, such as by adding milk to cereal, butter to bread or other

condiments to meals. This may be similar to an 'accompaniments' feature, which is also time-saving.

- Similarly, it may be useful to enable several foods, such as salad ingredients, to be added at one time.

Nutritional Feedback

- Graphical feedback is generally well received; however, the graph must be simple enough to understand without being misinterpreted.
- Graphs could be quantified to indicate a proportion or percentage RDI.
- Recommendations and nutrition advice from the programs were well received; this may be given via consultation with the dietitian, or through the program.
- The amount and type of nutritional feedback provided to the patient should be decided by the dietitians.
- Inclusion of the chemical content of foods (low, medium, high, very high and chemical type) would be beneficial to patients with food intolerance.

Format and Layout

- Simplicity and clarity of the layout and function of the program is a priority.
- The whole screen should be used, and a larger font size.
- Layout of the record by meal and snacks is logical, and appropriate for the majority of patients.
- Including all parts of the record (search, meal entry, possibly some nutrition information) on one page is less confusing to users.

Conclusion

The first aim of this study was to determine the attitude of patients at the RPAH Allergy Unit to using a computer to keep a diet record. The response from the 15 interviews conducted was largely positive, and most participants were found to be quite enthusiastic about the idea of the program. Participants particularly enjoyed receiving instant dietary feedback on the foods they entered into the program, and saw ensuring nutritional adequacy as one of the main purposes of the program. Participants felt that they would learn about nutrition from using the program, and that it would increase their awareness of the food choices they make. Participants also recognised the potential for the program to be used to manage health and medical conditions, including allergy and intolerance. Another purpose identified by participants included accessing advice from the dietitian from home, which was especially appreciated by patients from country areas.

The study also aimed to gather information about the patient's experience using different internet diet record programs in order to assist the development of an internet based diet record and analysis program suitable for use in the Allergy Clinic as well as other dietetic applications. A number of recommendations have been made as a result, and these are outlined below. After trialling two web-based diet record and analysis programs, participants were able to identify a number of advantages to using such programs from their own perspectives. Along with the benefits of receiving nutritional feedback and avoiding unnecessary travel to see the dietitian in person, participants reported that the computerised record was easier and quicker to use than a written record, as well as being tidier and not likely to be lost. People who spent a lot of time on the computer felt that it would be more convenient and time-saving than a written diary. Participants identified a number of additions to the basic function of the program, which may be incorporated in the future. These included growth charts for children and menu ideas, as well as an indication of the chemical content of different foods.

As could be expected, not all participants felt the program would suit them, and a number of disadvantages to using the program were also identified. These particularly related to problems with computer or internet access, or to a lack of computer skills. Participants who were not confident using computers felt that entering foods into the record was a lot of work. Access issues included a lack of access to computers throughout the day, requiring the patient to enter the foods into a written diary during the day and then loading it onto the computer at night, doubling the time needed to record foods. While all participants in the study had internet access at home, it was noted

that not all people have that access. In these situations, the patient may prefer to use a written food record, and that option should remain available to them.

Most participants were able to use the program easily, although some basic instructions were usually needed to get started. Difficulties occurred as a result both of problems using the program, or a lack of knowledge about food. Problems with the program can be overcome by careful design to make the layout and functioning, especially of the search function, as straightforward as possible. A lack of awareness of foods, such as inability to estimate portion size or to include ingredients in a recipe are more difficult to manage, but can be improved by including familiar brand names and measures of portion size, as well as providing instructions before asking a patient to use the program. It is hoped that the difficulties encountered in using the programs in this study, as well as the positive aspects identified, will assist in the development of a user-friendly program that meets the needs of both patients and dietitians.

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Appendix A: Outline of Questions used in In-Depth Interviews

1. Demographic information

- Age of participant
- Age of patient
- Gender
- Occupation
- Computer access(home/work)
- Rate confidence with computers (1 very uncomfortable → 5 very confident)
- Have you ever completed a food record before?

2. Questions (including possible probing questions):

- What do you see as the purpose of the diet analysis program?
- What is good and what is not so good about the different examples you have seen?
 - What made that good/bad/etc?
 - Ask for examples- format, design, searching for foods, feedback/results given
 - What would you change about it?
 - What improvements would you like to see?
 - What would make it easier to use?
- What would be the advantages and disadvantages for you to keep a food record in this way?
 - What difficulties do you think someone may have keeping a food record in this way?
 - How might these problems be overcome?
 - Convenience/time?
 - Computer access/literacy?
 - Compared to keeping a written record?
- Is there anything further you would like to add?

3. Format of the interview:

- Introduction and explanation of purpose; consent to interview and involvement in research
- Collect basic information about participant
- Explain *Calorie King Online*; trial with participant
 - Note any general comments
- Explain *Formula for Life*; trial with participant

- Note any general comments
- Discussion with participant using in-depth interview technique

Demographic Information on participants in comparing web application nutrition analysis systems

Participant number: _____

Age of participant: _____

Age of Allergy Clinic patient/s (if different from above): _____

Gender: M F

Occupation: _____

Computer access: None Work Home Both

Rate Confidence using computers:

1	2	3	4	5
Very uncomfortable	Uncomfortable	Ok	Confident	Very Confident

Have you ever completed a food record before? Yes No

Verbal consent to participation in research: Yes No

(Understands the purpose of interview and the use of information gathered from the interview)

Questions for In-Depth interviews for the Analysis of a nutrition and dietary intake web application

Calorie King Online: Comments

Formula for Life: Comments

What do you see as the purpose of the diet analysis program?

What would be the advantages and disadvantages for you to keep a food record in this way?

What is good and what is not so good about the different examples you have seen?

Is there anything further you would like to add?

Appendix B: Coding Frame

1. Comments on *Calorie King Online*

1.1 Problems with use

- 1.1.1 Difficulty spelling
- 1.1.2 Difficulty estimating portion size
- 1.1.3 Difficulty entering different number of portions (eg. 6x 1 cracker)
- 1.1.4 Unclear about adding milk to cereal etc
- 1.1.5 Uncertain if drinks should be added with foods
- 1.1.6 Entering amount used in recipe rather than individual portion eaten
- 1.1.7 Taking computer's suggestion of a 'serve' rather than estimating/wanting to weigh food
- 1.1.8 More intuitive to click on meal before adding foods for some people
- 1.1.9 Not reading/understanding serving size- eg, putting 2 'servings' of bread (2x2 slices) when wanting 2 slices
- 1.1.10 Didn't know how to view other serving size options under drop-down box
- 1.1.11 Confusion over process of diet record- think it is to 'create a diet'
- 1.1.12 Lack of food knowledge- entering boiled noodles for 2 minute noodles

1.2 Dietary Feedback given by program

- 1.2.1 Better at understanding the line rather than numbers
- 1.2.2 Good how it could tell you what I need to eat and how much I should drink
- 1.2.3 That would be good because I don't think I do eat enough everyday
- 1.2.4 That's pretty nifty! I like that
- 1.2.5 Uncertain what data means
- 1.2.6 Liked fluid and exercise record
- 1.2.7 Not clear how to interpret line
- 1.2.8 Good how it does the calculations for each food and meal
- 1.2.9 Measurements are good for anyone
- 1.2.10 Very good/interesting
- 1.2.11 It gives you a visual, so you can see it
- 1.2.12 If I can see how much she should be getting if I put in a typical diet for her, that would be good
- 1.2.13 It would make you a bit more aware
- 1.2.14 I like this part with the little graphs and things
- 1.2.15 It's quite informative, with all the information listed with food entries
- 1.2.16 I like the way it tells you how much you've used out of your daily allowance

1.3 Difficulty/Ease of Use

- 1.3.1 Really easy once you figured out how to find foods on the list
- 1.3.2 Pretty good, once you've done one meal, it's easy to do the rest

- 1.3.3 Fairly easy
- 1.3.4 Would get much quicker when you know where to find things
- 1.3.5 Straightforward
- 1.3.6 Quite user-friendly
- 1.3.7 If you can't type, that's always a problem
- 1.3.8 For me it's fine; may be a little complicated for the average user, it would take a bit of time to get started
- 1.3.9 Once I found out how to get around it, it wasn't too bad
- 1.3.10 Not too hard
- 1.3.11 Long process, frustrating, time consuming
- 1.3.12 You have to make sure they can read, if someone has low literacy

1.4 Food Databases and Searching

- 1.4.1 Not searching for ingredients in a meal eg. searching for 'sandwich' instead of bread and cheese etc.
- 1.4.2 Homemade foods not on database
- 1.4.3 Entering new foods not intuitive- would just 'choose something similar'
- 1.4.4 Search results are all pre-prepared meals
- 1.4.5 Some search results not relevant- search for 'cream' produced Starbucks coffees but not pouring cream within first 30 results
- 1.4.6 At home it would be easier because you have the brands and sizes
- 1.4.7 You really have to know the brand
- 1.4.8 A few foods took a while to find
- 1.4.9 Maybe break search up into categories to narrow the search down
- 1.4.10 Search for toast instead of bread- few results
- 1.4.11 Uncertain how specific to be
- 1.4.12 I make a lot of stuff myself, the stuff in the supermarket is not what I would buy
- 1.4.13 Having the right brand is important because brands vary a lot and it would be misleading to put the wrong thing in
- 1.4.14 Difficulty searching again if food did not come up the first time
- 1.4.15 Doesn't have vitamin supplements
- 1.4.16 Submenus would help make it easier to find things

1.5 Format of Program

- 1.5.1 New layout is simpler/easier
- 1.5.2 I like them simple
- 1.5.3 Old layout is easier to read
- 1.5.4 Easier to change mistakes on the old style because of tick boxes
- 1.5.5 Could have tabs to put foods from the elimination diet to pick from
- 1.5.6 Old style is better because you can see it all
- 1.5.7 Not using the whole screen- a lot of 'dead area' on the screen
- 1.5.8 Too much text- especially a problem for people who are vision impaired

- 1.5.9 Old style is better practically, as it uses more of the screen
- 1.5.10 Colours clash on old style
- 1.5.11 Old style clearer without search panel on the side to confuse you

1.6 Extra Features of Program

- 1.6.1 'Favourite Foods' is good because we eat the same things a lot
- 1.6.2 'Favourite Foods' is good for the elimination diet
- 1.6.3 'Custom Foods' is good because we're such a multicultural society and some foods may not be in there

2. Comments on *Formula for Life*

2.1 Problems with use

- 2.1.1 No brand names makes it difficult to identify product used
- 2.1.2 Portion sizes are a bit odd
- 2.1.3 Calculate button confused people
- 2.1.4 Limited database means it is not a true reflection of intake
- 2.1.5 Different foods chosen off list if desired food not in database
- 2.1.6 Not obvious where to click to start entering foods
- 2.1.7 Uncertain about putting in ingredients to make up a homemade meal or snack
- 2.1.8 Difficulty estimating portion size unless you weigh it

2.2 Dietary Feedback given by Program

- 2.2.1 Difficulty interpreting graph- understanding meaning of recommended intake line
- 2.2.2 It shows a lot more of the actual vitamins to make sure you have them all
- 2.2.3 Good that you can see how you went over a period of time
- 2.2.4 I like the graph- it's quicker and easier to see what you've had
- 2.2.5 Graph gives the impression that food groups should be eaten in equal amounts
- 2.2.6 Graph is not very clear for someone who is not science-minded
- 2.2.7 Would be easier if graph had more labels on it to indicate what each part means
- 2.2.8 Not easy to find out how many milligrams are recommended
- 2.2.9 Not as good as bars on Calorie King visually
- 2.2.10 Prefer figures to just a graph
- 2.2.11 It listed more of the nutritional value of things
- 2.2.12 It makes you aware of what nutrients they should be having
- 2.2.13 Ideal, especially for kids to see if they get the right amount of nutrients
- 2.2.14 I'd like to know the number, graph only shows proportions you have but not values you need
- 2.2.15 Nutrition information doesn't mean much to me at this stage
- 2.2.16 Good to have the percentage of recommended intake
- 2.2.17 Both food group and nutrient graphs helpful

2.3 Difficulty/Ease of Use

- 2.3.1 It's a bit more confusing than Calorie King
- 2.3.2 Would need a bit longer to understand what you should do
- 2.3.3 It's easier to put in the meals because you can look at the big list rather than typing it in and struggling to find it
- 2.3.4 It's not as easy as Calorie King to navigate
- 2.3.5 People who aren't as confident with the internet would find it difficult
- 2.3.6 Quicker because it's just clicking on foods
- 2.3.7 Too wordy
- 2.3.8 Small text, hard to read layout
- 2.3.9 More time consuming because you need to look at the content of the pack to choose which food it is

2.4 Food Databases and Searching

- 2.4.1 Not as easy as Calorie King because you can't just type it in
- 2.4.2 A lot of meals are already done- what if you don't have all that stuff normally?
- 2.4.3 I would have thought different brands would have different nutrients
- 2.4.4 This [food list] is too much information
- 2.4.5 Not as accurate because it spells out what things are (whole meals)
- 2.4.6 They have dry baked pumpkin but not dry baked potato
- 2.4.7 The food list is a bit restrictive
- 2.4.8 Trying to search through the food list is very difficult
- 2.4.9 It's easier to just type in what I want and know it will come up
- 2.4.10 Too many choices
- 2.4.11 Pretty detailed if you have to put in everything
- 2.4.12 I have no idea what is in the food that I'm buying, so food descriptions are unhelpful
- 2.4.13 You have to know the content of everything
- 2.4.14 You'd have to weigh everything to know accurately
- 2.4.15 Would not be beneficial if you are not confident you put in the right food

2.5 Format of Program

- 2.5.1 I like less words, I'm more of a visual person
- 2.5.2 This setup would not work for me
- 2.5.3 Husband would prefer this because he likes lots of information and reading
- 2.5.4 This one's laid out better to find things
- 2.5.5 The set out is fairly straightforward
- 2.5.6 Too much of the screen is taken up with things you do not use
- 2.5.7 Takes too long to get information
- 2.5.8 A little bit more moving around to find things
- 2.5.8 Food categories are a bit confusing

2.6 Extra Features of Program

- 2.6.1 Liked 'Accompaniments' because it's quicker to pick things that go with it
- 2.6.2 I suppose you could save a meal and change it if you needed to that morning
- 2.6.3 'Recent Foods' is good because you can just grab things you have on a daily basis
- 2.6.4 Recommendations are very good
- 2.6.5 Accompaniments are good because it is helpful not to have to keep entering it into the search
- 2.6.6 Would be better if you could enter foods not in the database
- 2.6.7 Liked the 'My Meal' because I tend to cook everything myself, so like to be able to put your own recipe in
- 2.6.8 If you can put in your own recipes it gives you a proper indication of how you are actually eating
- 2.6.9 'Add to My Meals' looks like it is what you need to do to add the meal to that day, when it is intended to save the meal for future use- name not clear
- 2.6.10 'My Meals' is good because the kids tend to have the same things
- 2.6.10 'Recommendations' good to tell you what you need to do to get up to scratch
- 2.6.11 'Accompaniments' useful for jogging the memory

2.7 Suggestions for Improvement

- 2.7.1 Submenus would help within categories to shorten search results- present limited options each time to narrow it down for you
- 2.7.2 If you're making a sandwich it would be easier to have some options down the side
- 2.7.3 Would like to be able to add things together eg. sandwich ingredients
- 2.7.4 It would be good to be able to pick more than one vegetable at once
- 2.7.5 Graphs and text could be bigger
- 2.7.6 Would be better if all things were on one page to save changing back and forth
- 2.7.7 Would like something where you could add the whole meal at once

3. Purpose of the Programs

3.1 Nutritional Adequacy

- 3.1.1 Good to make sure I'm getting everything I need
- 3.1.2 Good to compare over a week
- 3.1.3 I always worry about whether [child] is getting a decent balance and enough
- 3.1.4 Calorie counter, to look at how much protein or carbohydrate
- 3.1.5 Analyse diet on a daily basis to see if constantly low in something
- 3.1.5 Tracking what you are eating and making sure you are covering what you need to be
- 3.3.6 To make sure she's getting the variety and right vitamins in her diet
- 3.3.7 It would give you a complex look at your diet so you knew what you lacked
- 3.3.8 The most important things I would look at are energy, fibre, salt and sugars
- 3.3.9 It's nice to know if you're eating too much or not enough
- 3.3.10 To keep track of your food intake

- 3.3.11 You know how much you need and can compare what you eat
- 3.3.12 Whether her dietary needs are being met
- 3.3.13 To see where you are falling down so you can make sure you eat the right sort of food
- 3.3.14 To make sure I have enough calcium and a balanced diet
- 3.3.15 To look back over the week and see how you were going

3.2 Access at Home

- 3.2.1 It's good that they're on the internet so you can have a go at home
- 3.2.2 Good because we live far from town so seeing the dietitian is difficult
- 3.2.3 Saves coming to Sydney too often
- 3.2.4 Convenient

3.3 Managing Health

- 3.3.1 Good for people with weight issues or diabetes
- 3.3.2 Helps you manage your own diet and health better
- 3.3.3 Good weight loss tool
- 3.3.4 For me personally for dietary watching and exercise
- 3.3.5 If you put the bad stuff in, it probably shows you that it is something you don't want to put in to your diet
- 3.3.6 Basically one of those weight watchers diaries but online
- 3.3.7 If you weren't feeling well and just wanted to know why you weren't

3.4 Meal Planning

- 3.4.1 You could even do a menu plan for the week
- 3.4.2 You could think about during the week what you had to make up and what you didn't

3.5 Increased Awareness of Intake

- 3.5.1 It would probably make me more aware of what child eats
- 3.5.2 When child is not with me, to make sure the carer tells me what she is eating in case she is picking up things she should not have

3.6 Education

- 3.6.1 If you don't know enough about the nutrients you should be eating you learn from it
- 3.6.2 To be informed about your nutrition
- 3.6.3 It teaches you what you need to be eating and lets you know if you have enough

3.7 Allergy and Intolerance

- 3.7.1 Have not thought about it from a food allergy perspective, probably not as worthwhile as for nutritional value and weight loss
- 3.7.2 To record child's reaction to various foods, to see if she's reacting to anything
- 3.7.3 If she has any allergies, to be able to look at her day and see if there's any common

food

3.7.4 If you're on a diet and you want to closely monitor what you're having

3.7.5 For someone with an allergy, so they can summarise this for the doctor and their own benefit

3.7.6 To notice some improvement in what they were eating week to week if they were trying some specific kind of diet

3.7.7 To make sure there's enough variety and vitamins while on the elimination diet

4. Advantages and Disadvantages of keeping a Food Record in this way

4.1 Avoid Travel

4.1.1 We wouldn't have to travel all the way down all the time

4.1.2 Contact with dietitian over internet would be easier than having to come in

4.2 Nutritional information

4.2.1 We could see how much one food throws it

4.2.2 Helpful to see what we've done right or where we've gone wrong

4.2.3 Instant feedback

4.2.4 It's good that they tell you what foods you get different nutrients out of

4.2.5 You might use it to get into a pattern of what you want to eat and update it to send it to the allergist

4.2.6 I like the accumulative totals of nutritional values and calories

4.2.7 Easy to analyse and compare

4.2.8 Much better to get instant feedback rather than waiting 8 weeks, as it is a long time in a baby's life

4.2.8 Seeing how much we eat would be an advantage

4.2.9 You'd have to be fanatical about doing it for an allergy or a medical problem you had to monitor closely

4.2.10 The advantage would be that it's all stored and it calculates everything for you

4.2.11 The advantage is knowing what your fat intake is, your nutrition

4.2.12 I would be learning how to control what I eat, educating myself on what I should be eating

4.2.13 If there was online support by the dietitian, that would be ideal

4.2.14 There may be some discrepancy there, but not enough to cause a change in your child

4.2.15 It would be good to be able to graph a record over time

4.2.16 I wouldn't automatically know a standard serving, whereas the computer worked it out for me

4.2.17 You would be much more conscious of what you are feeding them

4.2.18 It would be a bit of an eye opener, and might end up leading to some changes

4.2.19 The disadvantage would be that I would see that I was very unhealthy! But I'd be able to clean up my act

4.3 Convenience/time

- 4.3.1 Disadvantage would be remembering to do it
- 4.3.2 It was reasonably quick to put in what he eats because he doesn't have a huge repertoire of foods
- 4.3.3 Putting in ingredients in cooking would be time consuming, but ok if you can do it once and save meal
- 4.3.4 You would write it down during the day and enter it onto the computer at night, which would be a pain
- 4.3.5 You wouldn't want to sit there three times a day
- 4.3.6 More convenient than getting out a calorie counter book
- 4.3.7 Easy access
- 4.3.8 Save space, less paper
- 4.3.8 Doubling up because you have to write it down through the day and enter it in later
- 4.3.9 You'd have to have the time to do it, but it's worth it for someone's health
- 4.3.10 Time consuming, a lot of work, too much hard work unless there is a purpose to do it
- 4.3.11 Convenient once you're in the routine of doing it
- 4.3.12 It's not too much time
- 4.3.13 You'd have to remember to do it, but it would be easy enough to do
- 4.3.14 Would be ok to do it in the short term, for a month, not all the time
- 4.3.15 Daughter is high school, could probably do it herself, they're quite happy to do that sort of thing
- 4.3.16 Not everyone has that sort of discipline, depends how much you want to do it
- 4.3.17 Time is an issue, but it would be easy enough to just jump on the computer and do it

4.4 Comparison to Written Record

- 4.4.1 Depends if you are a computer person or not
- 4.4.2 May be easier to just sit down and do it quickly rather than drag the diary out
- 4.4.3 This one calculates it for you and gives you a result
- 4.4.4 I'd prefer to use the computer to writing things down
- 4.4.5 It's faster to use the computer
- 4.4.6 It retains all the information for you
- 4.4.7 The information is there on the database
- 4.4.8 If you are writing it down it's not as easy
- 4.4.9 It's an automated approach
- 4.4.10 Neater and set out nicely, more attractive to do
- 4.4.11 Can't lose the diary- it's on the computer so can't get accidentally thrown out
- 4.4.12 Probably easier and quicker than a written record
- 4.4.13 I'd prefer the computer/internet version; it's easier than writing everything down
- 4.4.14 Computer is much better- much more detailed, much more accurate and easier
- 4.4.15 For me, online would be particularly helpful rather than a paper diary, because I could do it anywhere
- 4.4.16 The advantage is it has to be complete or there would be bits missing

- 4.4.17 I think probably 80% of people would prefer the computer
- 4.4.18 Tend to lose a printed one
- 4.4.19 I wouldn't be able to do it easily, I'd prefer to use a bit of paper
- 4.4.20 For most mums it would be quicker to write it down
- 4.4.21 People who are not computer literate or slow would take too long
- 4.4.22 Disadvantage if they decide to fold and you have information with them
- 4.4.23 I would find it easier to write something down, I'm not a computer person

4.5 Computer Access/ Skill

- 4.5.1 Internet not very reliable
- 4.5.2 Computer can be slow
- 4.5.3 Computer is on all day every day, so convenient to access
- 4.5.4 Access to computer throughout the day is a disadvantage- would do it all at the end of the day
- 4.5.5 Would need to make sure you can access the program
- 4.5.6 With everything in my life the computer is on so you could do it straight away, at home or at work
- 4.5.7 If you were away from the internet you'd obviously have trouble
- 4.5.8 It would be quite daunting for someone who doesn't use computers much, they'd probably be better writing it down
- 4.5.9 Internet in country areas may be slow or unavailable

5. What is Good and Not So Good about the Programs

5.1 Entering Foods into Record

- 5.1.1 Formula for Life is harder because you can't just type in what you are looking for
- 5.1.2 It was hard to find a simple food on Formula for Life, they all had other things added; anaphylactic people tend to eat simple meals
- 5.1.3 Serving size was a bit difficult to estimate compared to what you use at home
- 5.1.4 Prefer the way Formula for Life has categories, and you don't have to type things in, so it is easier to find something
- 5.1.5 If you didn't spell it right, you wouldn't find it on Calorie King
- 5.1.6 Formula for Life had limited menu choice
- 5.1.7 Formula for Life database is not suitable for elimination diet- does not have obscure foods
- 5.1.8 More typing involved in Calorie King, you have to be able to spell
- 5.1.9 A lot of Calorie King is based on store-bought products, the second one had more info
- 5.1.10 Easier to find foods using food categories
- 5.1.11 Only difficulty is having to look at contents of food to know what to choose on Formula for Life
- 5.1.12 Having brands lets you enter the foods accurately, and avoids searching through a big list

- 5.1.13 Calorie King was less work to start off with
- 5.1.14 Too much information on Formula for Life

5.2 Nutrition Feedback

- 5.2.1 The information from Calorie King is easier, you can tell if you have gone wrong or not
- 5.2.2 I think Calorie King would be easier for younger people too
- 5.2.3 Feedback on Calorie King is simple and effective
- 5.2.4 Formula for Life tended to go into all the vitamins, some people think that's really good
- 5.2.5 Formula for Life is better, more people want more information on the nutrients
- 5.2.6 Graphs on Formula for Life were good
- 5.2.7 Graphs telling you if you are under or over are useful
- 5.2.8 I'd use Formula for Life, because it gives more feedback

5.3 Extra Features

- 5.3.1 Being able to save a meal would be good so you don't have to look it up each time
- 5.3.2 Accompaniments were quite good, to quickly make up a meal rather than typing it in individually
- 5.3.3 Good having the recommendations
- 5.3.4 Having exercise to counterbalance the food intake is good
- 5.3.5 Accompaniments down the side is good so you can tick boxes rather than typing more searches in
- 5.3.6 Good to be able to enter in your own recipe and analyse that
- 5.3.6 Important to be able to add in foods, because it may be biased against other nationalities
- 5.3.7 Having saved meals helps because a lot of people eat the same things all the time
- 5.3.8 Like the idea of having commonly used foods in a favourites type of list
- 5.3.9 Good to have an area you can put favourite foods, because I tend to buy what I know she's not going to react to.

5.4 Suggested Changes

- 5.4.1 The name accompaniments is not helpful- sounds like condiments, so would not think of using it to add fillings to a sandwich etc
- 5.4.2 Sub-menus to avoid a long list to read through
- 5.4.3 Slightly larger font
- 5.4.4 Formula for Life needs a quick way to get back to the main page
- 5.4.5 Would be good to have a weight tracker, or growth chart for children
- 5.4.6 A search by key words would be good- search for spaghetti bolognese and then having a list of ingredients would be useful
- 5.4.7 It might be good to have a search bar that you could drag foods over to your meals
- 5.4.8 Make use of the whole window
- 5.4.9 Should have very clear lists on what's low, moderate and high chemical load

5.4.10 Maybe suggested menus and portion sizes for babies

5.4.11 Other links to read up on symptoms

5.5 Format of Screen

5.5.1 Doesn't have to be so cluttered

5.5.2 Both have a long list you have to read through

5.5.3 'Old Style' on Calorie King has less information on the screen at once

5.5.4 Liked the way that 'Old Style' Calorie King has boxes to tick down the side

5.5.5 Formula for Life is not as user-friendly, harder to navigate

5.5.6 Calorie King is all on one page, easily laid out, while Formula for Life you had to click on different pages to get to different things

5.5.7 Liked having the search feature on the same page as the meal plan

5.5.8 Formula for Life did not seem pleasant to look at

6. Other Comments

6.1 Meal or Time of Day

6.1.1 Meals is good, as it allows snacks in between

6.1.2 If you wanted details of what you're eating exactly when, half or one hour blocks would probably work, but meals works as well

6.1.3 Time of day, you'd have to carry a diary with you so you'd be doing the diary as well as this

6.1.4 Meals are good or it gets too confusing. We basically do breakfast, lunch and dinner and snacks, so I think that's easy

6.2 Cost

6.2.1 If there was a cost involved in having online support from a dietitian it wouldn't concern me

6.2.2 Does it cost money to use these?

6.3 Attitude to the Program

6.3.1 It's nifty! I like that.

6.3.2 If it means working for this little one, it's worth it

6.2.3 It's worth it if you're trying to keep someone well, improve their health

6.2.4 I might consider trying it out at home, I have a couple of friends who I could see using it as a tool

6.2.5 My husband would be interested in this, he reads food labels more than me

6.2.5 I think it's a great idea, especially for communication, it's better communication, and getting the information straight away

Appendix C: Summary of Participant Demographics

Participant age (years): 41; 27; 24; 34; 38; 51; 41; 36; 39; 35; (30, 31); 45; (34, 28); 47; 20; [20-51; mean=35]

Patient age (years): 12; 27; 24; 23months; 9; 51; 8; 36; 16months; 16 months; 10 months; 45; 1yr; 5; 20; [10months-51yrs]

Gender: 5 Male, 12 Female

Occupation: teacher; project manager; Exporter; account manager; IT specialist; office manager; sales assistant; software engineer; teacher; HR director; (public servant, pt. time social worker); office work; (electrical engineer, beauty therapist); mum; farm hand

Computer access: 10 both (home and work), 5 home only

Confidence using computers: 9 very confident, 5 confident, 1 Ok, 2 uncomfortable

Completed food record before? 4 Yes, 11 No