9. **INTRODUCTION**

Food habits are basically cultural habits. An individual's cultural background and orientation, combined with his or her personal characteristics and perceptions, will determine dietary patterns. This phenomenon is more apparent in elderly populations. The elderly tend to retain their cultural habits, which they often regard as being favourable to health. Moreover, they transfer these habits to future generations.

One of the aims of the IUNS project on 'Food habits in later life - cross-cultural approaches' is to observe whether there are a number of desirable food patterns which confer good health and longevity. This objective will lead to a better understanding of food-health relationships. There are at least 8 centres participating in this project, namely ACA, GRK-M, GRK-S, CTJ-R, CTJ-U, SWE, JPN-O and FIL. Most populations being studied are 70 years old and over, except CTJ-R, CTJ-U, and FIL.

This chapter will compare variables on food habits and food practices in the study centres and give details of the descriptive analyses used by the study centres. The results will be discussed, general conclusions drawn and suggestions put forward for future research.

9.2 **SUBJECTS AND METHODS**

9.2.1 **Subjects**

In this study 1305 elderly subjects, 561 men and 744 women, aged 53 to 104, were interviewed. Sampling methods for recruiting subjects, varied from one centre to another. Random sampling techniques using telephone directory listings were used in ACA and GRK-M [1]. In CTJ-U and CTJ-R, subjects were recruited from official government reports. In Johannesburg (SWE) of Sweden, the entire elderly population was recruited.
9.2.2 Methods

9.2.2.1 Food habits and practices

There were two variables on food habits and food practices which were consistent and comparable among all centres. These included questions on 'cooking vegetables' and 'cooking meat'. Additionally, the three variables: 'add salt to cooking, eat lean cuts of red meat, and eat fat on meat' were comparable among six of the centres (except for JPN-O and FIL). Specifically the variables on 'eat chicken with skin' was only comparable among four centres, namely ACA, GRK-M, GRK-S, and SWE. However, ACA had a different classification of responses (see Table 9.1).

9.2.2.2 Cooking methods

Cooking methods for various food items were measured in all study communities. Variables describing cooking methods were divided into two major food groups, meat dishes and vegetables. Listed options in cooking methods were 'casseroled', grilled, roasted, and fried.

9.2.2.3 Meal pattern

Detailed variables on meal patterns were measured in five centres (ACA, GRK-M, GRK-S, SWE, and FIL). For practical considerations, meals were defined as breakfast, morning tea, lunch, afternoon tea, dinner and supper. Meal patterns in CTJ emphasised food frequency, and instead of recording time of eating, respondents were asked whether or not they had their meal on time. Snacking was expressed in a qualitative way.
Table 9.1. Questionnaire comparisons on food habits and food practices by IUNS study centre.

<table>
<thead>
<tr>
<th>Food Practices</th>
<th>ACA</th>
<th>CTJ-U</th>
<th>CTJ-R</th>
<th>GRK-M</th>
<th>GRK-S</th>
<th>SWE</th>
<th>JPN-O</th>
<th>FIL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eating habits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat lean cuts of red meat</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Eat fat on meat</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Eat skin of chicken</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Add salt/sauce at table</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Cooking habits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grains</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Meat</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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</tr>
<tr>
<td>Add salt to cooking</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
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<tr>
<td>Salty sauce in cooking</td>
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<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Add sugar to cooking</td>
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<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td><strong>Meal pattern</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Times of meals</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Eat between meals</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Type of nibbles</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Past and current food intake</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meat</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dairy products</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vegetables</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fruits</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fat/oil</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Grains</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

+ = available in the data set  - = not available in the data set
9.2.2.4 Past and current food intakes

There were four centres which collected data on past and current food intakes, namely ACA, GRK-M, GRK-S and SWE. Comparisons between past and current intake were classified under five food groups: meat, dairy products, vegetables, fruits and grains.

9.3 STATISTICAL ANALYSIS

Descriptive analyses of the data set were employed. Data were expressed as a percentage of the elderly for each variable.

9.3.1 Limitation of the data

Nonuniformity of the variables and the small sample sizes (especially for old elderly men in ACA, CTJ-R, CTJ-U and old elderly females in ACA) limit the interpretation of the data. Memory problems in the elderly could affect variables on past food intake. Comparison between past and current food intake could indicate the frequency in which foods were consumed or the quantities consumed.

9.4 DESCRIPTIVE ANALYSES BY STUDY CENTRES

9.4.1 Food habits and food practices

The majority of cohorts in the study communities of ACA, GRK-M, GRK-S and SWE consumed lean cuts of meat (ranging from 47% in old elderly men in SWE to 93% in young elderly women in GRK-M) (Figure 9.1). Compared to their female counterparts, fewer young and old elderly men in SWE (55% and 47% respectively) consumed lean cuts of meat. On the other hand, less than 40% of both young and old elderly, men and women, in CTJ-U and CTJ-R, consumed lean meat (ranging from 10% in old elderly men and young elderly women in CTJ-U to 30% in old elderly men in CTJ-R). A greater proportion of men than women consumed lean meat in CTJ-R. In urban probands, more young elderly men than young elderly women consumed lean meat whereas the opposite occurred in the old elderly community (Figure 9.1). In Figure 9.2 less than 50% of respondents consumed chicken with skin except the old elderly in ACA (ranging from 10% of young elderly females in GRK-S to 49% in young elderly in SWE). Compared with other study centres, a greater proportion of SWE subjects consumed chicken with skin (35% in old elderly women to 49% in young elderly men). Elderly GRK-S represented the minority group in terms of consuming chicken with skin (See Figure 9.2). Overall, the elderly in ACA represented a major group who never added salt to cooking (ranging from 23% in young elderly men to 43% in old elderly women). However, the old elderly men in ACA added salt to cooking (Figure 9.3). Most cohorts in GRK-M, GRK-S, SWE, and FIL added salt to cooking. However, elderly subjects who never added salt at the table ranged from 22% in young elderly men in GRK-S to 71% in old elderly women in ACA (Figure 9.4). A considerable number of elderly men in
GRK-S sometimes consumed salt at the table (21% in old elderly men to 50% in young elderly men) (Figure 9.4).

**Figure 9.1.** The percentage of elderly who eat lean cuts of meat, by age group, study community and gender.

**Figure 9.2.** The percentage of elderly who eat the skin of chicken, by age group, study community and gender.
Figure 9.3. The percentage of elderly who never add salt to cooking, by age group, study community and gender.

Figure 9.4. The percentage of elderly who never add salt at table, by age group, study community and gender.
9.4.1.1 Cooking methods

Methods of cooking meat/fish/poultry commonly used by cohorts included 'casseroling' (which ranged from 55% in young elderly men in ACA to 100% in old elderly women in GRK-M), roasting (from 43% in elderly women in ACA to 98% in young elderly men in GRK-M), and grilling (from 43% in old elderly women in ACS to 81% in young elderly men in GRK-M). Grilling meat was not common in elderly SWE (11% in young elderly women to 15% in old elderly women). Commonly used methods of cooking or preparing vegetables were boiling (which ranged from 75% in young elderly men in JPN-O to 100% in elderly GRK-M), and casseroling (from 57% in young elderly women in SWE to 94% in young elderly men in GRK-M). Preparation of salad ranged from 79% in young elderly men in JPN-O and old elderly women in SWE to 98% in young elderly men in GRK-M.

9.4.1.2 Meal pattern

9.4.1.2.1 Breakfast

Most elderly people in the study communities who had breakfast between 7 and 8 AM ranged from 36% in old elderly women in FIL to 96% in old elderly women in GRK-S. Significant numbers of elderly people in GRK-S had their breakfast 1 hour earlier than those in GRK-M. One explanation for this time difference is that the study in GRK-S was conducted only during summer whereas the study in GRK-M was carried out over four seasons. Breakfast time for the elderly in SWE was usually at 11 AM (Figure 9.5).
Figure 9.5. The percentage of elderly who have breakfast between 7 to 8 AM, by age group, study community and gender.

9.4.1.2.2 Morning tea

For those elderly who had morning tea, most of them had it between 10-11 AM (ranging from 21% in old elderly men in GRK-S to 57% in old elderly men in GRK-M) (Figure 9.6). However, significant numbers of the cohorts did not have morning tea (ranging from 43% in old elderly men in GRK-M to 74% in old elderly men in GRK-S) (Figure 9.7).

Figure 9.6. The percentage of elderly who have morning tea between 10 to 11 AM, by age group, study community and gender.
Figure 9.7. The percentage of elderly who do not have morning tea, by age group, study community and gender.

9.4.1.2.3 Lunch
Photo 9.1.  Australia, Melbourne (Greek) 1990-91: woman (late 70s) lives alone in a unit; preparing lunch (cauliflower Au gratin and chicken schnitzel: not traditional Greek dishes).

Photo 9.2.  Australia, Melbourne (Greek) 1990-91: Greek man (early 70s) enjoying lunch (main meal of day). Comprised of roast chicken, pastichio (spaghetti, meat, white sauce), broccoli, carrot, celery, two pieces of feta cheese.

The majority of cohorts had their lunch between 12 and 1 PM (ranging from 58% in old elderly women in FIL to 95% in young elderly women in ACA) (Figure 9.8).

Figure 9.8. The percentage of elderly who have lunch between 12 to 1
9.4.1.2.4 Afternoon tea

Afternoon tea was consumed between 3 and 4 PM by the majority of cohorts (ranging from 40% in young elderly women in FIL to 75% in old elderly men in GRK-M) (Figure 9.9). Most elderly GRK-S had their afternoon tea at 5 PM (ranging from 46% in old elderly women to 74% in old elderly men). On the other hand, considerable numbers of elderly in the study communities did not have afternoon tea (ranging from 14% in old elderly men in GRK-M to 54% in young elderly women in FIL). Afternoon tea was less popular among elderly men in ACA and FIL than those in GRK-M and GRK-S. In elderly women, the difference between those who had afternoon tea compared to those who didn't was less marked. Gender differences for elderly who did not have afternoon tea was observed in elderly women (Figure 9.10).

Figure 9.9. The percentage of elderly who have afternoon tea between 3 to 4 PM, by age group, study community and gender.
9.4.1.2.5 Dinner

Most respondents had dinner between 6 and 7 PM (ranging from 55% in young elderly women...
in FIL to 88% in young elderly women in ACA). The majority of elderly in GRK-S had their dinner at 8 PM (ranging from 50% in young elderly men to 84% in young elderly women) (Figure 9.11).

**Figure 9.11.** The percentage of elderly who have dinner between 6 to 7 PM, by age group, study community and gender.

**Photo 9.3.** Melbourne, Australia (Anglo-Celtic) (1992): a typical Anglo-Celtic Australian meal consisting of meat (roast beef) and 3 vegetables (mashed potato, carrot, boiled cabbage).
9.4.1.2.6  Supper

Supper was generally consumed between 8 and 9 PM, although it was only eaten in certain study communities, including ACA, FIL, GRK-M (ranging from 1% in young elderly women in FIL to 58% in young elderly men in GRK-M). A greater proportion of men in GRK-M had supper compared to women (Figure 9.12). The majority of respondents who did not have supper ranged from 29% in old men in GRK-M to 100% in GRK-S (Figure 9.12).

Figure 9.12. The percentage of elderly who have supper between 8 to 9 PM, by age group, study community and gender.
9.4.1.2.7  Meal patterns of the elderly in CTJ

Most respondents consumed three meals per day (84% in young elderly men and women in CTJ-R to 97% in young elderly women in CTJ-U), and these meals were not usually eaten 'on time' (80% in old elderly men in CTJ-R to 100% in young elderly men in CTJ-U). Most individuals often snacked between meals (51% in young elderly men in CTJ-R to 100% in young elderly men in CTJ-U). However, significant numbers of elderly did not snack often (24% in young elderly women in CTJ-R to 40% in old elderly men in CTJ-R).

9.4.1.2.8  Meal patterns of the elderly in SWE

In SWE, meal patterns were expressed as a total number of meals per day. Total number of meals consumed ranged from 2 to 7 meals in young elderly men, 3 to 8 meals in old elderly men, 3 to 8 meals in young elderly women, and 3 to 6 meals in old elderly women. Four meals were consumed by 21% of old elderly men to 41.2% of old elderly women. Respondents consuming 5 meals ranged from 29.8% in young elderly men to 39.2% in old elderly women. Some respondents had 6 meals per day ranging from 5.9% in old elderly women to 12.9% in young elderly women (see Table 9.2).
It should be noted that in SWE the elderly consume 2 types of breakfast. Breakfast I, included bread and beverage and/or breakfast cereals, porridge, or egg; whilst breakfast II, only included beverage, crisp rolls, and/or cookies/buns. Breakfast time was usually 11 AM. Lunch was defined as a meal which included something more than 2 sandwiches for instance an egg, porridge, soup, fish or meat. Lunch was normally consumed between 11 AM and 3 PM.

9.4.2 Past and current food intake

9.4.2.1 Past and current intake of meat

Generally, the elderly in the study communities currently consumed less pork than in the past. The majority of elderly people in GRK-S have maintained their low pork consumption, and this may have contributed to the significant differences in past consumption of pork between GRK-M and GRK-S. As far as lamb intake was concerned, the elderly in ACA, GRK-S, and SWE currently consumed less lamb than in the past. Beef was eaten more regularly in elderly GRK. Similar findings were found for chicken intake in elderly GRK and ACA (see Table 9.3).

Table 9.2. Total number of meals per day in elderly Swedes.

<table>
<thead>
<tr>
<th>Meals</th>
<th>Males</th>
<th>70-79 n = 47</th>
<th>80+ n = 19</th>
<th>Females</th>
<th>70-79 n = 47</th>
<th>80+ n = 19</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2.13</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>23.4</td>
<td>3</td>
<td>15.8</td>
<td>6</td>
<td>8.6</td>
</tr>
<tr>
<td>4</td>
<td>13</td>
<td>27.7</td>
<td>4</td>
<td>21.0</td>
<td>24</td>
<td>34.3</td>
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<td>5</td>
<td>14</td>
<td>29.8</td>
<td>7</td>
<td>36.8</td>
<td>23</td>
<td>32.9</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>12.8</td>
<td>2</td>
<td>10.5</td>
<td>9</td>
<td>12.9</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>4.26</td>
<td>1</td>
<td>5.26</td>
<td>6</td>
<td>8.6</td>
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<tr>
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<td>0.00</td>
<td>2</td>
<td>10.53</td>
<td>2</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Table 9.3. Comparison between past and current intake of meat by age group and study community.

<table>
<thead>
<tr>
<th>Centre</th>
<th>Meat</th>
<th>Ate more in the past %</th>
<th>Eats more now %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Young</td>
<td>Old</td>
<td>Young</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td>ACA</td>
<td>Beef</td>
<td>46.5</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Lamb</td>
<td>51.2</td>
<td>56.4</td>
</tr>
<tr>
<td></td>
<td>Chicken</td>
<td>18.6</td>
<td>25.6</td>
</tr>
<tr>
<td></td>
<td>Fish</td>
<td>20.9</td>
<td>33.3</td>
</tr>
<tr>
<td>GRK-M</td>
<td>Beef</td>
<td>16.7</td>
<td>17.2</td>
</tr>
</tbody>
</table>

Food Habits in Later Life

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9.4.2.2 Past and current intake of dairy products

Current intake of cheese (feta) has dropped in elderly GRK compared to past intake. Similar findings were found in yoghurt consumption by elderly GRK-S. On the other hand, more elderly in ACA and SWE have increased their yoghurt intake. However, most elderly GRK-S have maintained their low milk intake, while the elderly in SWE have reduced their milk consumption (see Table 9.4).

Table 9.4. Comparison between past and current intake of dairy products by age group and study community.

<table>
<thead>
<tr>
<th>Centre</th>
<th>Food item</th>
<th>Ate more in the past %</th>
<th>Eats more now %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Young elderly</td>
<td>Old elderly</td>
<td>Young elderly</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td>ACA</td>
<td>Milk</td>
<td>34.9 41.0 0.0 33.3</td>
<td>16.3 12.8 14.3 0.0</td>
</tr>
<tr>
<td></td>
<td>Cheese</td>
<td>30.2 28.2 0.0 33.3</td>
<td>34.9 30.8 0.0 0.0</td>
</tr>
<tr>
<td></td>
<td>Yoghurt</td>
<td>7.0 7.7 14.3 0.0</td>
<td>37.2 51.3 14.3 33.3</td>
</tr>
<tr>
<td>GRK-M</td>
<td>Milk (cow)</td>
<td>49.2 47.7 35.7 44.4</td>
<td>32.3 35.6 53.6 44.4</td>
</tr>
<tr>
<td></td>
<td>Cheese (feta)</td>
<td>87.7 83.1 82.1 88.9</td>
<td>4.6 8.5 14.3 8.3</td>
</tr>
<tr>
<td></td>
<td>Yoghurt (cow)</td>
<td>84.6 89.8 82.1 85.7</td>
<td>1.5 6.8 14.3 11.4</td>
</tr>
<tr>
<td>GRK-S</td>
<td>Milk (cow)</td>
<td>0.0 0.0 0.0 0.0</td>
<td>3.1 6.5 0.0 0.0</td>
</tr>
<tr>
<td></td>
<td>Cheese (feta)</td>
<td>75.0 80.6 89.5 86.4</td>
<td>21.9 12.9 5.3 9.1</td>
</tr>
<tr>
<td></td>
<td>Yoghurt (cow)</td>
<td>28.1 22.6 16.7 31.8</td>
<td>31.3 29.0 38.9 36.4</td>
</tr>
<tr>
<td>SWE</td>
<td>Milk</td>
<td>65.2 46.3 33.3 39.5</td>
<td>4.4 10.4 5.6 4.6</td>
</tr>
<tr>
<td></td>
<td>Cheese</td>
<td>21.3 13.2 11.1 25.6</td>
<td>29.8 27.9 16.7 25.6</td>
</tr>
<tr>
<td></td>
<td>Yoghurt</td>
<td>2.9 4.6 16.7 0.0</td>
<td>68.6 65.1 33.3 75.0</td>
</tr>
</tbody>
</table>

9.4.2.3 Past and current intake of vegetables

The majority of probands in ACA have maintained their vegetable intake (root, cooked and salad vegetables). Considerable numbers of elderly people in GRK-M, GRK-S, and SWE have maintained root vegetable intake. The elderly GRK-M reported to have reduced their green leafy vegetable intake. The opposite findings were observed in elderly GRK-S and SWE. The elderly
in GRK-M reported to have reduced their consumption of marrow, and other (tomato) vegetables. Gender differences in past and current intake of flower vegetable were observed among elderly GRK-S. An increased consumption of marrow and flower vegetables was observed in elderly SWE (see Table 9.5).

Table 9.5. Comparison between past and current intake of vegetables by age group and study community.

<table>
<thead>
<tr>
<th>Food item</th>
<th>Ate more in the past %</th>
<th>Eats more now %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Young elderly Men</td>
<td>Women</td>
</tr>
<tr>
<td>ACA Root vegetables</td>
<td>32.6</td>
<td>28.6</td>
</tr>
<tr>
<td>Cooked vegetables</td>
<td>30.2</td>
<td>14.3</td>
</tr>
<tr>
<td>Salad vegetables</td>
<td>20.9</td>
<td>14.3</td>
</tr>
<tr>
<td>GRK-M Root vegetables</td>
<td>22.7</td>
<td>35.6</td>
</tr>
<tr>
<td>Leafy vegetables</td>
<td>80.3</td>
<td>81.4</td>
</tr>
<tr>
<td>Marrow vegetables</td>
<td>84.8</td>
<td>86.4</td>
</tr>
<tr>
<td>Flower vegetables</td>
<td>54.5</td>
<td>47.5</td>
</tr>
<tr>
<td>Others</td>
<td>81.8</td>
<td>88.1</td>
</tr>
<tr>
<td>GRK-S Root vegetables</td>
<td>9.4</td>
<td>12.9</td>
</tr>
<tr>
<td>Leafy vegetables</td>
<td>9.4</td>
<td>22.6</td>
</tr>
<tr>
<td>Marrow vegetables</td>
<td>35.5</td>
<td>32.3</td>
</tr>
<tr>
<td>Flower vegetables</td>
<td>28.1</td>
<td>41.9</td>
</tr>
<tr>
<td>Others</td>
<td>37.5</td>
<td>54.8</td>
</tr>
<tr>
<td>SWE Root vegetables</td>
<td>38.3</td>
<td>35.3</td>
</tr>
<tr>
<td>Leafy vegetables</td>
<td>17.1</td>
<td>13.8</td>
</tr>
<tr>
<td>Marrow vegetables</td>
<td>23.3</td>
<td>21.2</td>
</tr>
<tr>
<td>Flower vegetables</td>
<td>26.1</td>
<td>20.6</td>
</tr>
<tr>
<td>Others</td>
<td>15.6</td>
<td>16.4</td>
</tr>
</tbody>
</table>

9.4.2.4 Past and current intake of fruit

Most elderly ACA have maintained their fruit intake. The elderly in GRK-M and GRK-S have increased their citrus fruit and apple consumption. The elderly GRK-M reduced their stone fruit intake. However, the opposite findings were observed in elderly GRK-S. Most cohorts in SWE have maintained their intake of citrus fruit, stone fruit, apples and pears. A significant number have increased their intake of tropical fruit (see Table 9.6).
Table 9.6. Comparison between past and current intake of fruit by age group and study community.

<table>
<thead>
<tr>
<th>Food item</th>
<th>Ate more in the past %</th>
<th>Eats more now %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Young elderly Men</td>
<td>Young elderly Women</td>
</tr>
<tr>
<td>ACA</td>
<td>Citrus fruit</td>
<td>27.9</td>
</tr>
<tr>
<td></td>
<td>Apple/pear</td>
<td>23.3</td>
</tr>
<tr>
<td></td>
<td>Stone fruit</td>
<td>37.2</td>
</tr>
<tr>
<td></td>
<td>Tropical fruit</td>
<td>11.6</td>
</tr>
<tr>
<td>GRK-M</td>
<td>Citrus fruit</td>
<td>21.2</td>
</tr>
<tr>
<td></td>
<td>Apple</td>
<td>40.9</td>
</tr>
<tr>
<td></td>
<td>Stone fruit</td>
<td>86.4</td>
</tr>
<tr>
<td></td>
<td>Tropical fruit</td>
<td>89.4</td>
</tr>
<tr>
<td>GRK-S</td>
<td>Citrus fruit</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>Apple</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>Stone fruit</td>
<td>6.2</td>
</tr>
<tr>
<td></td>
<td>Tropical fruit</td>
<td>9.7</td>
</tr>
<tr>
<td>SWE</td>
<td>Citrus fruit</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td>Apple/pear</td>
<td>21.7</td>
</tr>
<tr>
<td></td>
<td>Stone fruit</td>
<td>23.3</td>
</tr>
<tr>
<td></td>
<td>Tropical fruit</td>
<td>12.2</td>
</tr>
</tbody>
</table>
9.4.2.5 Past and current intake of fat/oil

Most cohorts, in both ACA and SWE, have reduced their butter consumption. Increased consumption of margarine and oil was observed in elderly ACA and SWE. With respect to lard, the elderly in ACA reported to have reduced their intake. On the other hand, a significant number of elderly in SWE have maintained their lard intake. GRK-M reported a marked increase in margarine consumption and a decrease in oil consumption where as GRK-S have maintained their high intake of oil and have not introduced margarine into their diet (see Table 9.7).

<table>
<thead>
<tr>
<th>Food item</th>
<th>ACA</th>
<th>SWE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lard</td>
<td>62.8 48.7 42.9 16.7</td>
<td>36.4 33.3 22.2 18.8</td>
</tr>
<tr>
<td>Butter</td>
<td>67.4 53.8 14.3 0.0</td>
<td>66.7 69.1 72.2 57.1</td>
</tr>
<tr>
<td>Margarine</td>
<td>20.9 20.5 0.0 0.0</td>
<td>17.8 16.7 11.8 20.9</td>
</tr>
<tr>
<td>Oil</td>
<td>16.3 15.4 0.0 0.0</td>
<td>9.1 13.0 20.0 3.6</td>
</tr>
</tbody>
</table>

Table 9.7. Comparison between past and current intake of fat/oil by age group and study community.

9.4.2.6 Past and current intake of grains

The elderly in GRK-M and GRK-S have reduced rice and pasta consumption. This is not the case in elderly SWE. Although there has been a slight reduction in rice intake observed in elderly ACA, a significant number have increased their pasta consumption. A slight reduction in oat intake was reported in elderly ACA and SWE. However, the majority of cohorts in ACA have maintained their oat intake (see Table 9.8).
### Table 9.8. Comparison between past and current intake of grains by age group and study community.

<table>
<thead>
<tr>
<th>Food item</th>
<th>Ate more in the past %</th>
<th>Eats more now %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Young elderly</td>
<td>Old elderly</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>ACA</td>
<td>46.5</td>
<td>30.8</td>
</tr>
<tr>
<td>Oats</td>
<td>32.6</td>
<td>41.0</td>
</tr>
<tr>
<td>Rice</td>
<td>37.2</td>
<td>28.2</td>
</tr>
<tr>
<td>Pasta</td>
<td>11.6</td>
<td>10.3</td>
</tr>
<tr>
<td>GRK-M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>92.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Pasta</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRK-S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>14.9</td>
<td>59.7</td>
</tr>
<tr>
<td>Pasta</td>
<td>27.3</td>
<td>14.5</td>
</tr>
</tbody>
</table>

### 9.5 DISCUSSION

#### 9.5.1 Eating habits

One contemporary dietary recommendation is to eat more lean meat. Compared to conventional cuts, lean meat has less energy, fat and cholesterol. In lean beef, the energy, fat, and cholesterol content is reduced by 35%, 68%, and 6% respectively. In lean lamb, the reduction of energy, fat and cholesterol are more prominent. For example, energy, fat and cholesterol contents are reduced by 57%, 85%, and 14% respectively. Compared to chicken with skin, energy, fat and cholesterol of skinless chicken is reduced by 37%, 68%, and 12% respectively [2]. The findings indicate that the elderly in CTJ represented the minority who consumed lean cuts of meat. Most elderly in CTJ-R sometimes ate fat on meat, while most elderly in CTJ-U often ate fat on meat. Differences in cultural perception and beliefs may contribute to these findings (see Chapter 31).

Perception of food involves not only taste information (i.e. information about sweet, sour, bitter, and salty), but also olfactory and trigeminal information from the myriad of volatile components found in foods and beverages [3]. With ageing, threshold sensitivity, both for stimuli that are olfactory and for stimuli that are largely trigeminal, declines. Changes in taste or flavour preference suggest changes in smell and taste function in the elderly. Pleasantness ratings for sugar and salt have been reported to be higher in the elderly than in their younger counterparts [3], and as a result, elderly tend to use more added flavourings (e.g. salt) than young people [4].

A low zinc status may partly contribute to the decrease in taste in the elderly [5-7]. Cultural background also seems to influence preference and tolerance for salty tastes [8]. As a flavouring agent, salt was added to food while cooking by the majority of cohorts across the study.
communities. A significant number of respondents, however, never added salt at the table. The percentage of elderly who never added salt at table was lower in young elderly men in ACA, the elderly men in GRK-M, the elderly in GRK-S, and young elderly women in FIL. These findings indicate that as survivors, the elderly in the study communities are concerned with healthy eating. These dietary practices will have beneficial implications for the elderly as a group with an increased incidence of hypertension [9].

9.5.2 Cooking habits

Cooking is important in food processing. Cooking can produce the desired texture, flavour and palatability. Cooking is also necessary to ensure that food is free from harmful levels of micro-organisms. On the other hand, cooking can be detrimental to the nutrient content of food. The heat-sensitive and water-soluble vitamins B1, B2 and C generally serve as 'indicator nutrients' for qualitative changes made by cooking [10]. Methods of cooking meat commonly used by the majority of cohorts were 'casseroling', grilling, and roasting. Grilling and roasting meat results in good retention of B-vitamins. Grilling retains 60-80% of thiamin and 80-100% of riboflavin. Depending on the temperature used, roasting at high temperatures, such as 200°C, reduces retention rates of these vitamins; whereas longer heating periods at lower temperatures, 110-160°C (depending on the cuts), with an internal temperature of 70-75°C, results in a less significant loss of B vitamins [11].

Boiling was one of the most commonly used methods of cooking vegetables by the cohorts across the study communities. Although boiling can increase the degree of digestibility and solubility of fibre [12], leaching of nutrients may be extensive. With boiling, vitamin C retention can be as low as 77% (for example in boiled Brussels sprouts). Amongst the commonly used methods of preparing vegetables, perhaps making salad can be considered the preferred method. Salad is usually prepared from raw vegetables, thus nutrient retention is maximised. The energy content of salad will largely depend on the type and quantity of fat present in the dressing used.

Recent studies also report the effects of food processing on non-nutrient components of food, for example glutathione [13,14]. Glutathione is considered an antioxidant and anticarcinogen. Glutathione also has an immunoregulator capacity [15]. Thus, its existence is crucial, especially for the elderly who are disadvantaged by immunosenescence [16]. However, food processing and preservation generally result in an extensive loss of glutathione. While there was limited information on the consumption of processed and preserved foods in the cohorts, the above message merits consideration for future research.

9.5.3 Meal pattern

Many studies have reported the metabolic effects of meal frequency. One study [17,18] conducted on 440 men, aged 60-64, divided the men into 5 groups according to their meal frequency (group I: three or less, group II: three to four, group III: three to four with additional
snacks between meals, group IV: 3-4 with an additional snack at bed time, and group V: five or more meals). It was found that the prevalence of overweight was reduced from 57.2% in group I to 28.8% in group V, hypercholesterolaemia was reduced from 51.2% in group I to 17.9% in group V; glucose intolerance reduced from 42.9% in group I to 19.4% in group V. Further study with the same population group showed that ischaemic heart disease was significantly reduced with increased meal frequency from 30.4% in the subgroup with an infrequent meal pattern to 19.9% in the subgroup taking five or more meals per day [19]. The beneficial effects of nibbling on serum lipid levels were possibly related to a reduction in serum insulin levels [20].

Another study on animals by Cohn et al. [21] indicated that the intermediary metabolism of protein was related to feeding frequency. With fewer feedings but with total 24-hour intake constant, less dietary protein appears to participate in protein anabolic reactions since larger amounts of nitrogen were lost in the urine. Extrapolation of these findings to humans will require further studies. On the basis of various studies on metabolic changes and meal frequency, it can be concluded that several advantages have been ascribed to increased meal frequency with constant energy intake. An infrequent meal pattern was associated with a tendency toward obesity [22], hypercholesterolaemia, impaired glucose tolerance and also toward ischaemic heart disease. Comparison of data from IUNS showed that most elderly in the study population have 3 to 5 meals per day. The meals often excluded by the cohorts were, supper and morning tea with supper being the most frequently excluded meal. A further factor of interest in a cross-cultural comparison like this, is the past meal frequency of the cohort, taking into consideration their longevity. However, past meal frequency data was not available for comparison. Whether cross-cultural differences in meal frequency and their beneficial roles on metabolic changes of the cohorts exist would require more advanced analyses.

### 9.5.4 Past and current food intake.

The underlying mechanisms for food preferences can be biological (physiological and genetic) and cultural. Cultural transmission of food preferences commences in early life, at a time when social contacts are limited to the family [23]. With ageing, chronic degenerative diseases surface [9]. These phenomena may be contributory to the shift of food preferences from cultural to biological mechanisms. It is encouraging that the most commonly reported dietary changes in, for example, the previous Australian study (i.e. less eggs, red meat, high-fat foods and more vegetables and, fish) are largely in accord with dietary recommendations, and that there is a trend towards the use of polyunsaturated margarine and trimming of fat [24]. Information and education also affect food preferences.

Apart from underlying biological and cultural conditions, the cross-cultural observation of past and current food intake is likely to be affected by, differences in food supplies between the past (during second world war) and the present time (time when the study was undertaken), and the memory of the cohorts [25]. In the interpretation of this data, it should be noted that the cohorts
might have referred to the frequencies rather than to the quantities of consumption. Therefore, reduction in past or current intake could mean reduction in frequencies, but the serving size may have become larger. This was observed in the GRK-M sample and reported changes in pasta consumption (unpublished data).
9.6 CONCLUSIONS AND SUGGESTIONS

Food habits, food practices and cultures are inseparable. A transparent linkage between food and health is indisputable. The objective of the cross-cultural study of food habits and food practices of the elderly was to observe to what extent they contributed to good health and longevity. Such information is crucial for the development of health recommendations for elderly populations to improve their quality of life physically, psychologically and socially. It has been projected that more than 50% of elderly population will live in developing countries by the next century [26]. More developing countries, like Southeast Asia, India and Africa, should be included in the future studies. Sampling strategies should be improved by increasing the number of the old elderly subjects. The variables being measured should be uniform throughout each study centre. These changes would assist in the interpretation of the data as well as allow general comparisons to be drawn.

9.7 ADDITIONAL INFORMATION

9.7.1 Aboriginal Australians (A Kouris-Blazos)

9.7.1.1 Past food intake

The elderly living at Junjuwa were either born on a cattle station, police station or 'pub camp' in the Fitzroy valley region or moved to these places as young children from the tribal lands in the bush. Most of the elderly would have lived at the above mentioned places for at least 40 years before moving to Junjuwa. Work was offered in exchange for food rations, clothing, shelter and medical attention, which were also extended to the family of the 'worker'. There were no Government regulations regarding the type of food provided - it depended entirely upon the station.

On the cattle stations, Aboriginal and non-Aboriginal stockmen would muster cattle from March-November in 6 week blocks. They would return to the station for about 2 weeks between the 6 week mustering periods. A limited supply of food could be taken when mustering. This included tea, sugar, golden syrup, flour and occasionally some potatoes. Cattle would be killed for food, the left over salted and carried with them. The non-Aboriginal stockmen would return to the stations after 6 weeks with a disease afflicting the hands, called 'Barcoo rot'. This disease was treated with vitamin C and penicillin and was caused by not eating any fruit or vegetables whilst mustering. The Aboriginal stockmen rarely got this disease because they would eat bush food.

Aboriginal women usually worked in the morning at the stations (e.g. cooking, cleaning) and spent most afternoons searching for bush foods. Food rations were provided on weekdays and many stations also provided food on weekends and during holidays (November-March). Most families would spend their weekends in the bush. During holidays, Aboriginal families would

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leave the station for a couple of weeks and live in the bush.

Rations provided were as follows:

**Meat:**
On most cattle stations a bullock was killed every week. The first few days of the week fresh meat was given out in quarters i.e. hind leg, Shank etc., to feed family units. The remaining days of the week, fresh meat was salted for preservation, due to limited freezer space. Tinned meat was never rationed. Meat was eaten 2-3 times a day, 200-400 g serving. On the police station, a nanny goat was killed daily and rationed. Most of the meat was stewed or boiled in 'billy cans' as opposed to the traditional method of cooking on the coals. Curry, onions and potatoes were usually added.

**Offal:**
Liver, oxtail, rib bones (which were very popular), tripe, brains, marrow and bones (which were used to make soup) were often given out to Aborigines on a weekly basis.

**White flour/ bread:**
The flour was used to make damper(mixture of wheat flour and water and cooked in ashes); some stations found it more economical to bake bread and ration it, since damper requires a great amount of flour. Damper was eaten 3-5 times a day, otherwise 3-5 thick slices of bread a day were rationed.

**Oats:**
Rationed on some stations - eaten 1-3 times a week as porridge.

**Rice:**
Weekly ration.

**Vegetables:**
Most stations had large vegetable gardens. Aborigines would receive the surplus. When available, tomatoes, pumpkins sweet potatoes (which were very popular), carrots and cucumber were rationed. Cabbage, lettuce and cauliflower were not very popular. Potatoes and onions were rationed once a week. Most elderly would have eaten at least 2 potatoes and onions a week - they were usually added to stews or cooked on the coals. Vegetables were eaten on most days.

**Fruit:**
Fresh fruit was rarely rationed, unless if there was a surplus from fruit trees. Tinned fruit was rationed on most days on some stations.

**Bullock fat:**
Most stations did not ration butter or oil, however bullock fat was provided and (as it was liked
by Aborigines) it was used in cooking.

**Golden syrup/treacle/jam:**
Weekly ration. Of the three, golden syrup was the most popular. Honey was a luxury - too expensive to ration.

**Sugar:**
Weekly ration, very popular in tea.

**Salt:**
Weekly ration.

**Curry:**
Weekly ration, very popular in stews.

**Milk/cheese:**
Not rationed. On pub/police camps goat milk was rationed, particularly for children.

**Eggs:**
Not rationed.

**Tea:**
Weekly ration, at least one litre of very strong tea would be drunk daily.

**Tobacco:**
Weekly ration.

A typical diet history of distant (prior to 1960s) past intake would have been as follows:

**Breakfast:**
200-400 g damper or thick slice white bread/day golden syrup daily, 100-200 g salted meat/day, tea and sugar (couple of tablespoons) (no milk) - daily

**Morning tea:**
Slice bread and tea daily

**Lunch:**
Fresh/salted bullock/goat, stewed, sometimes on coals, 200-400 g/day (sometimes lamb was rationed). Potato and onion (2 of each a week), other vegetables if available, 200-400 g damper or slice bread/day, tea with sugar daily.

**Afternoon tea:**
Slice bread and tea daily. Women would go 'walk about' and collect bush foods - daily or on weekends.

**Dinner:**
200-400 g damper or slice bread daily, 200-400 g meat (stew or on coals) and bush food daily.

This diet history contrasts quite dramatically with current food intake. In the past, more red meat and less chicken was eaten; milk, cheese or chicken eggs were not consumed; less fruit and margarine were eaten; more offal, vegetables and bush foods were eaten and more dripping was used. Soft drinks, takeaways and alcohol were not available. Energy intake was higher but Aboriginals were more physically active and their diet was more nutrient dense due to frequent consumption of bush foods. Food intake was more or less constant from day to day in contrast to the current 'feast' and 'famine' days. Tea and sugar consumption have remained unchanged.

Additionally, the meat eaten prior to the 1960's was buffalo which was lower in fat than the beef currently bought by Aborigines: buffalo meat has only 4% fat (more polyunsaturated) where as lean cuts of beef have 10% fat (mainly saturated). Bush foods in the past were eaten on a daily basis or at least a couple of times a week when in season making up more than 50% of the diet (in contrast to current intake which is less than 10%). Bush fruits and bulbs were eaten on a daily basis, except for bush watermelon and passionfruit which were not available. Also, nectar and pollen from flowers were regularly made into drinks. Seeds however were rarely collected to make damper.

Men went hunting on weekends and women gathered bush foods daily. Kangaroo was eaten 1-3 times a week and the following foods were eaten about once a week when available: wild cat, dingo, cockatoo, flying fox, echidna, snake, turtle, duck, yabbies, ant eggs, brown ants, manna, caterpillars, insect galls, duck and turtle eggs. On most days of the week mussels, witchetty grubs, grasshoppers, sand frogs, bush honey, tree gum, goanna and fresh water fish were eaten. About once a month bush turkey, emu and eggs, pigeon and crocodile were eaten.

9.7.1.2 Meal pattern

Food quality and quantity of consumption was found to be closely connected to the weekly pension, resulting in a feast-famine type of eating pattern. When the pension was received (on Friday) food shopping was done for the week. Most perishable items were eaten over 3 days in large quantities (feast days). On the remaining days, non perishable items were consumed in smaller quantities (famine days). Less than 50% of the elderly Aboriginals consumed a lunch meal (week-days only) provided by a Government service (meals on wheels). There are a number of factors that may be contributing to such 'feast and famine' eating:

a) a natural inclination to "feast-famine"
b) inadequate budgeting skills
c) pension money is spent and food eaten quickly before it is taken by relatives or neighbours to purchase alcohol (excessive alcohol intake was evident in this community)
d) refrigeration and storage facilities in Junjuwa homes were limited.

The feast eating was tightly related to money availability and the pension cycle. The amount and type of food consumed by the elderly at each meal depended upon:
a) The number of persons sharing that meal.
b) Day of the week - from Friday-Sunday most perishable items were consumed and from Monday-Thursday mainly non-perishable items e.g. damper, tinned meat were consumed. 

c) Whether lunch was eaten at the primary school (Government service).

The type of food bought depended upon the packaging they have become accustomed to, as many elderly could not read English. Consumption of 'Western' foods was not reported to change much from the dry to the wet season and during floods. The frequency of consumption of popular food items is described below (see also Section 11.5).

**Fresh meat:**
Very popular, especially beef and lamb. T-bone and lamb chops/cutlets are the most popular followed by mince, chuck steak and rump. Fresh meat would be eaten about twice a week (or every day if eat meals on wheels) and serving size would vary from 100-400 g. Fat on meat is always eaten because it 'fills them up' and staves off hunger. The meat is usually boiled or stewed by the elderly in order to tenderise it for chewing. Thus meat is rarely fried or put on coals. Very little oil or margarine is added to cooking.

**Offal:**
Is liked and eaten occasionally (kidneys, liver).

**Chicken:**
Is more popular with the elderly because it is softer and easier to chew. The skin is always eaten. Chicken is usually boiled or bought from the roadhouse as fried chicken pieces. The latter is very popular and eaten about once a week. Serving size about 1-2 chicken pieces.

**Tinned meat:**
Very popular, especially tinned corned beef. Eaten about four times a week. Serving size 30-200 g. Kraft Braised steak stew is also popular and eaten about once a fortnight. Serving size 90-220 g.

**Sausages:**

**Frozen fish:**
Rarely bought and eaten.

**Tinned fish:**
Mainly sardines are eaten about once a week - they are very popular. Serving size 60-120 g. Tinned oysters are also very popular.

**Fresh fish:**
If caught from the river it is considered a treat. On weekends families go to the river and will sometimes bring back fish for the elderly, most of whom are either too frail to go fishing or are not taken by the younger adults who own vehicles. The fresh water fish usually caught include: barramundi, sword fish, black bream, catfish. Serving size 100-400 g.

Tinned spaghetti in tomato sauce:
Very popular, followed by spaghetti in meatballs. Eaten about once a week. Serving size 150-300 g.

Potatoes:
Very popular (especially sweet potatoes which are similar to the bush potato) and would be eaten 1-2 times/week (or every day if receive meals on wheels). Usually boiled or added to stew. Serving size 50-100 g.

Carrots:
Sometimes bought in tins or frozen and added to the stew (about once a fortnight). The meals on wheels stew contains carrots. Serving size: 20-40 g.

Peas:
Tinned/frozen, added to stews, eaten weekly. Serving size 20-40 g.

Pumpkin:
Liked but not regularly bought. It is added to meals on wheels. Serving size 20 g.

Corn:
Tinned is eaten once a fortnight. Serving size 20 g.

Onions:
Very popular, eaten twice a week, added to stews. Serving size 30 g.

Green leafy vegetables and other vegetables:
Not popular. Cabbage and cauliflower is sometimes added to stews, once a fortnight. Serving size 20g.

Fresh vegetable packs:
These contain fresh carrots, parsnip, celery and onion. Very popular, often bought instead of tinned or frozen vegetables. Serving size 40 g.

Fresh fruit:
Slightly more popular than vegetables, particularly bananas, apples, oranges, grapes and watermelon. Fruit is eaten twice a week (or daily if receive meals on wheels).
Tinned fruit:
Eaten occasionally.

Legumes:
Rarely eaten (including tinned baked beans).

Nuts:
Rarely eaten.

Breakfast cereals:
Porridge (1 cup) or Weet Bix (4-6) are eaten once a week.

Damper:
Plain white flour is used to make damper which is eaten 2-3 times a day. Serving size: 100-400 g. Baking powder is added to flour and kneaded to a dough with water. This can then be fried in the electric fry pan (known as Johnny cake), or can be cooked in the ashes or on the rack over an open fire. It is cooked for about 15 minutes. Almost twice as much flour is needed to make damper as opposed to bread. Damper is similar to scones. Damper is preferred to bread because it is more 'filling' especially on 'lean' days when little else is eaten. On average 500 g is eaten daily.

White bread:
Eaten about twice a week. Serving size: 2-5 slices.

Biscuits:
Mainly dry, are eaten occasionally.

White rice:
Popular and is eaten 1-2 times a week or daily if receive meals on wheels. It is usually boiled; curry and sometimes vegetables are added.

Fresh milk:
Rarely drunk by elderly.

Full cream milk powder:
Very popular and is mainly added to tea; about 4 tablespoons a day is consumed in tea.

Cheese, icecream and yoghurt:
Rarely eaten.

Eggs:
Eaten once a week or less. More popular with children.
Vegetable oil:
A little used to fry damper.

Margarine:
Preferred to butter because it comes in tubs and is easier to store. Used to fry and some elderly spread it on damper. About 1 teaspoon consumed daily.

Dripping/ lard:
Not used but fat on meat is eaten.

Spreads (e.g. jam, honey, vegemite, peanut paste):
These are used about twice a week. In the past golden syrup was popular, now jam has taken its place. Serving size 1-2 tablespoons.

Sauces (e.g. tomato, chilly, Worcestershire):
These are very popular with the elderly who appear to like strong tasting, savoury foods. They are used 2-3 times/week. Serving size: 2 tbs.

Packet soup:
Added to stews for flavour or drunk as a soup.

Curry powder:
Very popular, added to stews and rice.

Salt:
Very popular and is sprinkled liberally in cooking and on food. Elderly Aborigines in this community appeared to like salty/savoury foods. Serving size: 2 g/day.

Takeaway food:
Consumed once a week from the roadhouse. The elderly tend to buy the fried chicken pieces and chips. If the roadhouse was more accessible would be eaten a lot more often.

Sugar:
Used liberally, especially in tea. More than 2 tablespoons of sugar can be added per 500 ml mug of tea (1 litre tea drunk daily).

Soft drinks:
Not as popular with the elderly as they are with the younger adults. They are drunk 1-2 times per week. Serving size: 100-300 ml.
Occasionally drunk.

**Water:**
Rarely drunk; **Tea:** Very popular. Made very black and strong with loose tea leaves (which are not strained). About 1 litre of tea is drunk daily. Mugs used hold about 500 ml of tea into which 2 tablespoons of sugar and milk powder are added. **Coffee:** Liked but not drunk because more expensive than tea.

**Chocolate/sweets:**
Rarely consumed by the elderly.

*9.7.1.3 Cooking methods*

Boiled meat and stews were preferred to other cooking methods because foods cooked in such a manner were softer and easier to chew. They did not use much oil/fat in cooking but liked to eat the fat on meat because it was 'filling'. Sausages and cheese were not very popular. The elderly also preferred soft fruit e.g. bananas and oranges to hard fruits due to chewing difficulties. Damper (mixture of wheat flour and water, fried in oil or cooked in ashes) is the staple food. Flour is mixed with water to a dough and then fried in a pan as this is easier and faster than cooking it in the ashes of a fire. White damper is preferred to wholemeal damper because it was reported to taste better, was easier to chew and thought to be 'lighter'. Some believe that wholemeal flour contains weevils.

**Photo 9.7.** West Australia, Fitzroy Crossing, Junjuwa (1988): researchers weighing fried damper (flour and water mixed into a dough and fried) to determine average portion sizes consumed by elderly; damper is an important staple food.
Photo 9.8. West Australia, Fitzroy Crossing, Junjuwa (1988): woman making damper in the bush; flour is mixed with water on a piece of cloth; wood/twigs are used to make a fire.

Photo 9.9. West Australia, Fitzroy Crossing, Junjuwa (1988): cooking damper in the bush; the flour and water is kneaded and flattened into a thin pita style bread; the damper is then placed on hot ashes and covered with ashes and allowed to cook for about 20 minutes.
A wire rack was sometimes placed over the coals of an open fire to cook damper or meat. A small pot called a 'billy can' was used to make tea and meat stews by placing directly on an open fire. Loose tea leaves were used to make tea (unstrained). Although the flavour of coffee was liked, tea was drunk in preference due to its lower price. They generally reported a preference for savoury foods over sweet foods. However, station managers indicated that when Aborigines lived on cattle stations sweet foods were preferred.

9.7.1.4 Food purchase and food costs

Pensioners were not only faced with the difficulty of surviving on their limited income, but they often had to share that income with the extended family. About 50% of the pension was used to feed the rest of the family, especially the grandchildren. This does not take into account the money and food taken from the elderly by Aborigines under the influence of alcohol. Many pensioners have been compelled to lock up food in cupboards and trunks and can be seen with keys hanging around their necks. About ten elderly were using the local store bank to deposit their money. The money would last most of the week but is rarely saved for future needs. The rest of the elderly spend most of their money on food, the day the pension cheque arrives, to ensure that it is spent only on food. A store located only 20 minutes walk from Junjuwa sells a variety of foods, including fresh fruits and vegetables. Another store located only 5 minutes walk from Junjuwa sells mainly staples such as flour, tinned meat, bread, milk powder and tea, but does not sell fruit and vegetables.

9.7.1.5 Traditional foods

Bush foods no longer form a major part of the Aboriginal diet. It is estimated that about 80% of food consumed is usually purchased from a single community store (Young, 1984). At Junjuwa, Aboriginal families go fishing and bush fruit picking on weekends, but elderly are rarely taken in the vehicles because they are 'too much trouble'. The elderly either walk to the river (1 hour walk) or are too frail to go. The elderly rely on their children to bring back fish and bush fruit for them. However, when the younger adults go fishing or collect bush fruit, it is usually eaten when found and little is brought back to camp.

Most bush fruits eaten are collected around the river whilst fishing. Other bush fruits are far out in the bush and require a vehicle. This includes hunting for goanna. Most elderly do not have a vehicle and are rarely taken out by their families. Some bush fruit trees have been planted in yards at Junjuwa. This enables elderly to eat some bush fruit. Bush food is highly sought after by elderly and becomes an important source of food when the money and food runs out over the weekend. The acquisition of bush food has become highly dependent upon a vehicle due to the lack of bush foods in the region - so 'truck about' is now more common than 'walk about'. The indirect impact of European settlement due to overgrazing has caused widespread pasture degradation and soil erosion - many plant foods have become rare or localised. This has been matched by a loss in native animals. Displacement by introduced animals has played a role here. Kangaroo is no longer found in the Fitzroy Valley region. A list of bush foods was obtained from Aboriginal health workers, commonly eaten now and many years ago in the Fitzroy valley region (see below). It is impossible at present to quantify specific nutrient contribution to the diet from bush foods as no quantitative studies have yet been attempted. However, weekend nutrient contribution of bush foods when in season may be significant. The nutrient profile of each bush food is provided where available as there is a paucity of information on bush foods in the Fitzroy...
valley region. A number of sources were used to get this information [30-36]. There is great diversity of bush foods in Australia, which are both area and season specific. The nutrient composition of bush foods depends upon the season and state of the soil, method of collection and analysis. Bearing these points in mind, the nutrient values given below must therefore only be used as an indicator of the range of nutrients available from these species. The following bush foods make a small contribution to total weekly nutrient intake of the elderly diet when in season. Kangaroo, emu, insect galls, witchetty grubs, ants and many other bush foods are rarely eaten now and are thus not included below.

**Photo 9.11.** West Australia, Fitzroy Crossing, Junjuwa 1988: bush food gathering; researcher Dr Antigone Kouris-Blazos accompanied by elderly woman and her grandchildren in the search for bush foods.

**Gooseberry (Physalis peruviana)**

Description: Small low shrub, tiny yellow flower in shape of a bud, white berry is found in a green sac like pod, only the white berry is eaten which contains many little seeds, the berry is juicy and sweet and has a slight 'cucumber' flavour. Season: Wet; Location: Near the river, picked when fishing. Intake: Very popular, relished by children, eaten and picked in large quantities and usually some are taken back to camp. Nutrients/ 100 g: 0.13 mg thiamin, 0.7 mg vitamin C, other nutrients not available.

**Photo 9.12.** West Australia, Fitzroy Crossing, Junjuwa 1988: bush food gathering; the very popular and delicious bush gooseberries.
Wild passionfruit (Passiflora foetida)

Description: Native to South America, a climber with thin hairy stems and tendrils, leaves are pale green, hairy, 3 lobed, 5-7 cm long, flowers are pale purple, raw fruit is green and held by a fury 3-4 pronged 'claw', ripe fruit is yellow and tastes like bitter passionfruit. Season: Wet; Location: Near the river. Intake: Very popular, relished by children, picked and eaten in moderate quantities, some taken back to camp. Nutrients/100 g: 6.5g protein, 0.7g fat (mainly polyunsaturated), 155 kcal, 0 mg thiamin, 5 mg vitamin C, other nutrients were not determined.

**Bush cucumber or Wanbiri (Cucumis melo sp. agrestis)**

Description: Climber, low lying vine, large yellow flowers, fruit look like tiny watermelon, striped, pale green, 4 cm long, taste like cucumber and sweet when very ripe. Season: Wet; Location: In bush and by river. Intake: Very popular, relished by children, picked in large quantities but only a few eaten at a time because they sting tongue in large quantities - sometimes cooked to prevent this. Nutrients/100 g: 2 g protein, 0.98 g fat, 55 kcal, 0.05 mg thiamin, potassium 600 mg, sodium 10 mg, fibre 2 g, other nutrients not available.

**Photo 9.14.** West Australia, Fitzroy Crossing, Junjuwa 1988: bush food gathering; bush cucumbers are eaten raw.
River fig or Julubee (*Ficus coronulata*).

Description: Small tree, 4-8 metres high, drooping branches, long lanceolate leaves, marked venation, fruit 2 cm diameter when mature and rather tasteless and dry, raw fruit is green, ripe fruit is white. Season: Wet, picked at end of wet season when it has fallen to the ground. Location: By river and creeks, near Hospital and in Junjuwa. Intake: very popular, been planted in 2 elderly homes at Junjuwa, eaten in moderate quantities. Nutrients/100 g: Similar to other figs.

Bush apricot or Margouda (*Generic name unknown*)

Description: Low lying shrub, small leaves 3 cm long, has small black or white berries. Season: Dry; Location: River. Intake: Very popular, eaten in large quantities. Nutrients/100 g: Not reported.

Conkerberry or Marnikiji/Mannwigi (*Carissa lanceolata*)

Description: Dense shrub/thicket up to 2 metres with sharp thorns, leaves are bright green, white flowers very fragrant, fruit are small black with a milky juice. Season: Dry; Location: Far from
Junjuwa in bush, found on clay soil. Intake: Very popular, collected in large quantities, some taken back to camp. Nutrients/100 g: 70.3 g water, 1.9 g protein, 2.1 g fat, 143 kcal, 0.04 mg thiamin, 2 mg vitamin C, 5 mg sodium, 290 mg potassium, 54.9 mg magnesium, 23.8 mg calcium, 2.4 mg zinc, 0.03 mg copper, 11.20 mg of iron, 0.0016 mg cadmium.

_**Bush onion or Junda or Welbun (Cyperus bulbosus).**_

Description: Small plant with grass-like leaf and small onion-like bulb beneath, eaten raw or roasted in warm ashes, 1 cm diameter. Season: Dry - ready to eat when grass on top goes brown, optimal time is after wet but is available throughout year. Not eaten during the wet season, causes nausea. Location: Very popular with the elderly, will organise trips to get them because far away from Junjuwa in bush, not eaten as much anymore. Nutrients/100 g: cooked - 160 kcal, 49.9 g water, 2.6 g protein, 0.8 g fat, 37.5g carbohydrate, 5.7g fibre, 83 mg sodium, 1000 mg potassium, 286 mg magnesium, 47 mg calcium, 7 mg iron, 0.3 mg zinc, 1.0 mg copper, trace vitamin C, 0.185 mg thiamin.

**Photo 9.15.** West Australia, Fitzroy Crossing, Junjuwa 1988: bush food gathering; bush onions.

_Bush potato/Bush yam/Sweet potato (Vigna lanceolata)._  

Description: Ground creeper, sometimes found growing at base of boab trees, roots eaten raw or cooked in hot ashes, small thin tuber, has sweet potato like flavour, plant has oval leaves in clumps of 3. Season: Dry ; Location: Near water. Intake: Not easily accessible, will collect when in search of bush onion.
Nutrients/100 g: 78.3 g water, 2.4 g protein, 0.1 g fat, 86 kcal, 0.231 mg thiamin, 1 mg vitamin C, 8.6 mg sodium, 287 mg potassium, 112 mg magnesium, 155 mg calcium, 0.5 mg zinc, 0.15 mg copper, 17 mg iron.

**Photo 9.16.** West Australia, Fitzroy Crossing, Junjuwa 1988: bush food gathering; bush potato.

*Barramundi (fresh water fish)*

Eaten several times per year. Eaten very frequently in past. Nutrients/100 g: 38% saturated fat, 28% monounsaturated fat, 13% n-6 fat, 21% n-3 fat, 1% fat in muscle.

9.7.1.6 Food Beliefs

Aboriginals do not appear to associate good health with eating, but rather view food more as a 'comfort and pleasure'. Health is associated with social and spiritual well-being rather than with the physical world. Food is not selected on its nutritional value, but rather on what is available to them i.e., food they can afford or enjoy, food that is accessible, food that will 'fill them up' (e.g. damper and meat fat). Goanna, crocodile, fish, frogs, flying fox, snake, echidna, insect galls, fresh meat, wild grapes, wild plum and sugar bag (bush honey) believed to be good for children and old people. The fat on bush animals is highly prized and relished and regarded as 'good for you'. Some now realise that beef fat is not the same and is 'bad for you'.

The female of most species, especially goanna and kangaroo, are highly sought after because they have more fat, are more tender, have a better taste and sometimes have eggs. Ant eggs are
considered only good for adults, not children. If too many stem fruit figs are eaten they upset the stomach. Other food beliefs include that one should not eat too many river figs or bush cucumbers because they sting the tongue. One should not eat too many bush apricots because they are not 'good for you' and one must not touch the eyes with oily substance from bush passionfruit because it will sting. When a close relative dies, no meat is eaten because it resembles the body of the dead person and indicates that relatives are sorry about the death. Traditionally only marsupials were avoided. Now a wide range of protein sources are avoided - only fish can be eaten. The taboo can be broken with the permission of the family. If a person becomes ill, permission is given earlier. As the taboo can last for over a year, iron tablets are prescribed by health workers to those who are on a meat taboo.

9.7.2 Sweden (E Rothenberg)

The Swedish probands found it difficult to report changes in their food habits over the past 50 years. The reason is that food habits in Sweden have not have changed dramatically, even if there has been a slow development towards more healthy food habits. Therefore, this presentation is based on national food statistics. The changes in the popular diet in Sweden during industrialisation, i.e. the decades around the turn of the century can be explained by four interrelated sets of factors. Firstly by the switch-over towards higher production of pork and milk; secondly by economic growth and an increase in income which made it possible for households to chose more expensive foods, thirdly by the industrialisation of food production and food distribution, and finally by changes in housing. People began, to an increasing extent, to work outside the home. This trend continued through the second world war and the decades after that.

During the last 30 years health propaganda has influenced food habits markedly. Regarding the distribution of macronutrients there has been a continuous trend during the period from 1870-1980 with a trend break during the second world war. The consumption of protein was rather stable during this period (10-12% of total intake), while the intake of fat increased from 20% to 40% of total energy intake, whereas the intake of carbohydrates decreased from 70% to 47% of total intake. The proportion of sugar increased during the same period from about 5% of total energy intake to 15-16%. Direct consumption of sugar and syrup increased until 1940. Then it decreased. The indirect consumption, however, has increased since then. During the last 10 years there has been a small decrease in fat intake. Meat consumption increased during this period, except during the second world war. From 1950 to 1970 the total consumption increased from 51 to 60 kg per capita a year. Consumption of beef and veal decreased while consumption of poultry and game increased. During the 1960s there was a shift towards prepared, frozen and ready made food items and dishes. Fish consumption increased from 22 kg per capita in 1950 to 31 kg in 1990. The increase was mostly restricted to fresh and frozen fish. Potato consumption decreased from about 150 kg per capita a year in the late eighteen hundreds to 84 kg today, except for the period around the second world war, when consumption temporarily increased. Since 1960 the consumption of prepared potato products has increased from 3 kg to 22 kg per
capita in 1990. Consumption of fresh potato was 62 kg in 1990. Among elderly people the consumption of potato products such as chips, is presumably lower, and the proportion of fresh potatoes higher.

Vegetable consumption increased from 24 kg to 44 kg per capita, of which imported vegetables increased most (30%, 1960 and 50%, 1990, respectively). Frozen vegetables increased from 0.8 kg in 1960 to 4.0 kg per capita in 1990. Many vegetables have been introduced into Sweden during the last 50 years, such as green, red and yellow pepper, corn and olives. Raw vegetables and salad are eaten more today than 50 years ago. Annual intake of fruit increased from 51 kg in 1960 to 68 kg per capita in 1990. The proportion of imported fruits have increased from 55% to 83%. Bananas and melons are the fruits which increased most. Intake of juice from berries and fruit increased from 4 to 12 litres per capita during the same period. Through the increasing intake of vegetables, fruit and juice, the intake of ascorbic acid increased during the last 30 years. New fruits have been introduced in Sweden during the last 50 years, such as pineapple, kiwi and different types of melons.

The consumption of milk has varied during the last 40 years but the most recent trend is a decreasing intake. One hundred years ago the consumption was on average 150 litres capita a year - 1920 it was 250 litres. Since 1950 the consumption has decreased by 30%. Today the average consumption is 155 litres per capita. There has been a marked change towards low fat milk during the last 30 years. Consumption of fermented milk has grown during the last 20 years from 14 kg to 27 kg per capita. Cheese consumption has increased dramatically the last 20 years from 9 kg per capita in 1970 to 16 kg in 1990. During this period the Swedish food habits have been influenced, for example, by French cooking. It has become more usual to eat French cheese as a meal or as dessert than before. The intake of low fat cream (12% fat) has deceased during the last 40 years from 5 litres to 3 litres per capita. During this period it has become more usual to drink black coffee. High fat cream (40% fat) intake has increased from 2 litres 1950 to 6 litres per capita in 1990. Total intake of fat has increased during the last 100 years from about 4 kg per capita to 13 kg today. Since 1950 the consumption of butter has decreased since the consumption of margarine has become greater. Low fat margarine was introduced in the beginning of the 1980s and consumption has grown since then.

Intake of bread and cereals decreased from 1900 to 1970. After this period there has been a slow increase. Today the average intake is 51 kg per capita a year. In this period, fibre intake decreased since white bread became more popular. However, there has been a switch-over during the last 15 years towards bread rich in fibre and high fibre breakfast cereals. Alcohol consumption has also changed during the last 30 years. Consumption of beer and wine have increased from 1 litre to 19 litres and 3 litres to 13 litres per capita, respectively. Liquor consumption has fluctuated during the period and is now about 5 litres per capita. Spices such as garlic, oregano, basil and curry have become more usual during the last 40 years as well as influences from other cuisines such as the Greek, French and Italian.
9.8 SUMMARY

- A greater proportion of elderly ACA, GRK-M, GRK-S and SWE consumed lean cuts of meat compared with CTJ-U and CTJ-R elderly.

- Salt was added to food whilst cooking by the majority of elderly across the study communities. A significant number of respondents, however, never added salt at the table. Elderly ACA represented a major group who never added salt to cooking/at the table.

- Cooking methods which retain moisture (e.g. casseroles, sauces, boiling) were the most popular methods for preparing meat and vegetables amongst the elderly.

- The majority of elderly had breakfast between 7 AM, except Swedish elderly (11 AM). The majority of elderly had their lunch between 12-1 PM and dinner between 6-7 PM, except Spata elderly (8 PM). Afternoon tea appeared to be more popular than morning tea and supper.

- Elderly SWE, ACA, GRK-M and GRK-S reported to be currently eating more beef compared to when they were aged in their twenties, more margarine (except GRK-S), more yoghurt and pasta (except GRK-M, GRK-S) and similar intakes of fruit and vegetables.
9.9 REFERENCES


9.10 LEGEND TO THE FIGURES

Figure 9.1. The percentage of elderly who eat lean cuts of meat, by age group, study community and gender.

Figure 9.2. The percentage of elderly who eat the skin of chicken, by age group, study community and gender.

Figure 9.3. The percentage of elderly who never add salt to cooking, by age group, study community and gender.

Figure 9.4. The percentage of elderly who never add salt at table, by age group, study community and gender.

Figure 9.5. The percentage of elderly who have breakfast between 7 to 8 AM, by age group, study community and gender.

Figure 9.6. The percentage of elderly who have morning tea between 10 to 11 AM, by age group, study community and gender.

Figure 9.7. The percentage of elderly who do not have morning tea, by age group, study community and gender.

Figure 9.8. The percentage of elderly who have lunch between 12 to 1 PM, by age group, study community and gender.

Figure 9.9. The percentage of elderly who have afternoon tea between 3 to 4 PM, by age group, study community and gender.

Figure 9.10. The percentage of elderly who do not have afternoon tea, by age group, study community and gender.

Figure 9.11. The percentage of elderly who have dinner between 6 to 7 PM, by age group, study community and gender.

Figure 9.12. The percentage of elderly who have supper between 8 to 9 PM, by age group, study community and gender.

9.11 ILLUSTRATIONS

Photo 9.1. Australia, Melbourne (Greek) 1990-91: woman (late 70s) lives alone in a unit; preparing lunch (cauliflower Au gratin and chicken schnitzel: not traditional
Greek dishes).

Photo 9.2. Australia, Melbourne (Greek) 1990-91: Greek man (early 70s) enjoying lunch (main meal of day). Comprised of roast chicken, pastichio (spaghetti, meat, white sauce), broccoli, carrot, celery, two pieces of feta cheese.

Photo 9.3. Melbourne, Australia (Anglo-Celtic) (1992): a typical Anglo-Celtic Australian meal consisting of meat (roast beef) and 3 vegetables (mashed potato, carrot, boiled cabbage).


Photo 9.7. West Australia, Fitzroy Crossing, Junjuwa (1988): researchers weighing fried damper (flour and water mixed into a dough and fried) to determine average portion sizes consumed by elderly; damper is an important staple food.

Photo 9.8. West Australia, Fitzroy Crossing, Junjuwa (1988): woman making damper in the bush; flour is mixed with water on a piece of cloth; wood/twigs are used to make a fire.

Photo 9.9. West Australia, Fitzroy Crossing, Junjuwa (1988): cooking damper in the bush; the flour and water is kneaded and flattened into a thin pita style bread; the damper is then placed on hot ashes and covered with ashes and allowed to cook for about 20 minutes.


Photo 9.11. West Australia, Fitzroy Crossing, Junjuwa 1988: bush food gathering; researcher Dr Antigone Kouris-Blazos accompanied by elderly woman and her grandchildren in the search for bush foods.

Photo 9.12. West Australia, Fitzroy Crossing, Junjuwa 1988: bush food gathering; the very popular and delicious bush gooseberries.

Photo 9.13. West Australia, Fitzroy Crossing, Junjuwa 1988: bush food gathering; bush
passionfruit.

Photo 9.14. West Australia, Fitzroy Crossing, Junjuwa 1988: bush food gathering; bush cucumbers are eaten raw.

Photo 9.15. West Australia, Fitzroy Crossing, Junjuwa 1988: bush food gathering; bush onions.

Photo 9.16. West Australia, Fitzroy Crossing, Junjuwa 1988: bush food gathering; bush potato.
CHAPTER 9

FOOD HABITS AND FOOD PRACTICES

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