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Prison Foodservice in Australia – Systems, Menus and Inmate Attitudes

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Abstract

This paper presents results from three studies in 25 custodial facilities in three Australian states, including nutrient analyses of menus and focus groups exploring inmate attitudes.

Both cook-fresh and cook-chill production systems are used. Non-selective cycle menus of 4-6 weeks are common but inmates can supplement meals by purchase of additional food items (‘buy-ups’). Menus included adequate variety and met most nutritional standards, with the possible exception of fruit. The sodium content of menus is above recommended levels. Protein, fibre, vitamins A, C, thiamin, riboflavin, calcium, iron and zinc were more than adequate, and the percentage energy from fat is close to or meets national recommendations.

Focus groups identified 16 themes, including meal quality, food available at ‘buy-ups’, cooking facilities, and concerns about possible food safety risks associated with inmates storing food in cells. Many complaints were about factors not under the control of the foodservice manager.

Introduction

European settlement of Australia began with the establishment of penal settlements in 1788 to cope with overcrowding in British prisons. Early records of the rations provided to convicts show they fluctuated according to local harvests and the state of government stores, which suffered from disruption to shipping in Britain's war with France. In 1802 male convict rations consisted solely of 6 pounds of wheat, 3 pounds of salt pork and 6 ounces of sugar a week– which would have provided a barely adequate 8.7MJ of energy a day, but as early convict dietaries had no milk, butter, cheese, potatoes or vegetables they were lacking in many essential nutrients including vitamins A, B2, C and calcium (Walker & Roberts, 1988). Similar deficiencies in the diet probably existed throughout all sections of the population in England at that time, as both scurvy and rickets were prevalent (Davey *et al*, 1977).

By the 1820s, as the food supply improved Australian convicts had a diet with 10 times more meat than convicts in England (10.5 lb/week vs 1.01b) and an estimated available calorie supply almost 80% greater than in England (Nicholas, 1988), which was probably necessary to support the high level of manual labour performed by the convicts in establishing the new colony. Female rations were different. Unlike the men they received tea and sugar; in the 1830s the lowest class of female prisoners received only a quarter as much meat as men, but were given wheat bread (the men received only maize meal) and half a pound of vegetables daily (while the men still received none) (Walker & Roberts, 1988).

Even in those early years, starvation or malnutrition of prisoners was not an intended part of their general punishment. The official view was that the rations should be "simple, wholesome and sufficient for health but also economical and not such as to excite gastronomic enjoyment" (Walker & Roberts, 1988). This same view is reflected today in the Standard Guidelines for Corrections in Australia, that have been adopted by all of the State and Territory governments (Australian Institute of Criminology, 2004). The two relevant sections are:

2.12 Every prisoner should be provided with continuous access to clean drinking water and with nutritional food adequate for health and wellbeing, at the usual hours prepared in accordance with the relevant health standards.

2.13 Special dietary food should be provided where it is established such food is necessary for medical reasons, on account of a prisoner's religious beliefs, because the prisoner is a vegetarian, or where the prisoner has other reasonable, special need.

There are currently 88 prisons throughout Australia, including seven that are privately run (Roth, 2004). All prisons are the responsibility of the six states and two territories, and therefore the management and foodservice practices vary across the country (Biles, 1993). In June 2008 the full-time prison population was 26,677, of whom 93% were males (Australian Bureau of Statistics, 2008). Inmates are disproportionately young, ill, from indigenous backgrounds, socially disadvantaged, and with histories of sexual abuse and suicide as common life experiences (Levy, 2005). In the New South Wales Inmate Health Survey – conducted in 1996 and repeated in 2001 - it was found that 95% of women and 78% of men have at least one chronic health condition (Butler & Milner, 2003). The same survey revealed diet and nutrition to be the most prevalent issues of concern among inmates: overall, dissatisfaction among men and women was 68% and 47% respectively. Common complaints were poor food preparation and unhealthy choices. The 2001 survey indicated that 8-12% of NSW inmates receive a special diet and amongst this sub-population, 89% of females and 67% of males have encountered problems receiving their special diets.

The NSW survey also reported that 50% of men and 44% of women inmates were overweight or obese, an issue of concern given that the right to health for prisoners is defined in international law (Lines, 2008). These factors highlight the importance of considering the style and nutritional content of food provided to inmates, as well as the opportunities for exercise to support a healthy lifestyle, and the type of additional foods that are available for inmates to purchase with their own funds (colloquially and officially

known as ‘buy-ups’). However, the high level of smoking in prisons (Belcher *et al*, 2006; Richmond *et al*, 2006; Cropsey *et al*, 2008), ageing subgroups (Fazel *et al*, 2001; Potter *et al*, 2007), and the presence of both overweight inmates as well as those who are underweight (primarily due to drug abuse) confound where nutrition goals should be set for these groups.

In the past, inmate dissatisfaction with food has led to significant management problems. The 1978 Nagle Royal Commission into Prisons in New South Wales noted widespread complaints about food. While the food at lower security establishments was reported to be “quite good”, at the worst maximum security prison the food was described as “at best unpalatable and at worst not fit for human consumption” (Parliament of New South Wales, 1978). At that time fresh fruit was still a rarity in most prisons and food for evening meals was often prepared shortly after midday and then deteriorated while kept hot throughout the afternoon. The Commission recommended changes to improve facilities and implement monitoring of the nutritional quality of meals, as well as the employment of a dietitian to ensure that the dietary standards of food was adequate (Parliament of New South Wales, 1978).

In the 30 years since then, foodservice management in custodial facilities has changed substantially. More qualified catering staff have been employed to manage the food services, centralised cook-chill production systems have been introduced in many locations, with food production supervised by trained chefs, and menus have been substantially improved following review by qualified consultant dietitians. It has been noted that as the food in prisons has improved, Australian inmates are now more likely to complain of it as being “too fattening” and argot terms previously used to describe the era of starvation diets have disappeared from inmates’ lexicons through loss of relevance (Awofeso, 2004).

One recent example of a specific project addressing foodservice issues was The Well Women Project (WWP) based at the Adelaide Women’s Prison, a 12 month project funded by the Department of Human Services and coordinated by the Department of Correctional

Services in South Australia in 1999 (Nikolas, 2000). It arose out of complaints from women prisoners about the quality of food and the aims included:

- Increasing the nutritional balance and choice of food
- Increasing skills and knowledge of prisoners in relation to cooking and budgeting
- Improving food services and nutrition education standards in prisons.

The project was based on extensive consultation with the women inmates and outcomes included the development of new guidelines and benchmarks for nutrition standards and new recipes, as well as new bi-weekly cooking classes.

However, there are few studies that have been undertaken into the impact of the foodservice systems on the health of prisoners in Australia. The first was a small study of the menus in a women's prison in Victoria in 1982 (Fisher *et al*, 1988). While the menus appeared to provide adequate energy, and most nutrients were in excess of requirements, the availability of folate was low (22% RDA), dietary fibre (17.5g/d) was less than ideal, and there was a very high percentage of energy from fat (47%). A follow-up study in 1986 (after implementation of new 42 day cycle menu) found some improvements, with a fall in the percentage of energy from fat to 37%. In a sample of eight prisoners followed for two months, there were notable improvements in the numbers meeting recommended daily serves of breads and cereals, fruit and vegetables and milk compared to reported intakes before imprisonment, and all increased their subcutaneous fat stores (Tatnell *et al*, 1988).

This paper aims to report on several more recent and larger studies of the foodservices in correctional facilities from three Australian states: Western Australia (WA), New South Wales (NSW) and Queensland (Qld). In particular, the objectives were to describe and compare the food service systems and menus employed in the prisons in these three states, and also to report results from a focus group study of inmate opinions about the food services, conducted in three NSW correctional centres. The dietary review of custodial facilities in WA was a joint project of the Department of Health (DoH) and the Department of Justice (DoJ) conducted in 2002 (Department of Health Western Australia, 2004), and results from that report are summarised here for comparative purposes. In NSW in 2005, the Food Services Manager of Corrective Services Industries commissioned staff of the

University of Wollongong to conduct a nutritional analysis and review of the menus and to investigate the perceptions of inmates regarding the food services. In Qld, the Queensland University of Technology was commissioned by Queensland Corrective Services to provide independent dietary assessments of the publicly managed custodial facilities in the state and the analysis of assessments between 2006 and 2007 of high security centres is described here for comparison to other state facilities. The detailed findings from these latter two studies are reported here for the first time.

Methods

Western Australia Study

Catering staff were requested to save sample meals from three consecutive days of normal meal service at 17 custodial facilities throughout WA, with a total of 2900 inmates. Each site was visited by a consultant dietitian and the DoJ Catering Manager, meal samples were weighed and the chefs interviewed regarding ingredients and cooking methods. Purchase orders for staple foods were also reviewed. Menus were assessed for conformance with Core Food Group daily recommendations for adults (Cashel & Jeffreson, 1995). In addition the nutritional content was assessed using data from *Composition of Foods, Australia* (Cashel *et al*, 1989) and the fat content compared with recommended intakes: total <30%E; saturated <10%E, monounsaturated and polyunsaturated ≥10%E (National Health and Medical Research Council, 2003).

New South Wales Study

This study took place at a major correctional complex in Sydney, which includes three separate centres: (A) a remand centre for inmates awaiting trial, which caters for around 900 males; (B) a minimum security gaol that accommodates close to 500 male inmates, some of whom work in the central cook-chill kitchen, and (C) a maximum security centre with 160 female inmates. There were two parts to the study: a nutritional analysis of the menus and focus groups with inmates from the three centres.

Menu Analysis

The four-week Summer and Winter menus and all available recipes were obtained. Recipes were entered onto the FoodWorks™ nutrient analysis program (Version 3.02 Professional Edition, Xyris Software 2003) for nutrient analysis per serve for 21 nutrients: energy, protein, fat, saturated fat, cholesterol, carbohydrate, sugars, fibre, thiamin, riboflavin, sodium, vitamins A and C, folate, niacin, calcium, phosphorous, magnesium, iron, zinc and potassium.

The menus and nutrient analyses were then compared to the following national standards:

- Recommended Dietary Intakes, the new Nutrient Reference Values (NRVs) (National Health and Medical Research Council, 2006)
- The Australian Guide to Healthy Eating, which gives the recommended minimum number of serves of each food group for good health (Smith *et al*, 1998)
- A Food Variety Checklist which categorises food items botanically to examine the variety provided over a week, with a maximum score of 57. The ratings used were: <10 very poor, 10-19 poor, 20-24 fair, 25-29 good, >30 very good (Savige *et al*, 1997)
- The Dietary Guidelines for Australian Adults (National Health and Medical Research Council, 2003).

Focus Groups

Seven groups of inmates (n=35 in total) were selected from the three centres. Participants were recruited through selection by the custodial staff or by the research team selecting inmates from a nominal roll which was provided by the manager on duty. The participants were selected to represent a range of inmates, and also to include groups that have differing needs or expectations in relation to food, including Asian inmates and those on special diets. The inclusion criteria for the participants were that they must speak English and have been in custody at the current location for at least 2 months. Inmates deemed to be a risk to the researchers and those working in the kitchens were excluded.

At the beginning of each session an introduction was given, including an explanation of the purpose of the research and assurance of confidentiality. All sessions ran for approximately one hour and were digitally recorded and transcribed verbatim. Participants were asked open-ended questions about the foodservice they were currently receiving, and asked to freely comment on these issues. Qualitative analysis software, Nvivo 2.0 (QSR International Pty Ltd, 2002), was used for data management and coding of the transcripts. From the transcripts, 16 key themes were identified.

Queensland Study

Nutritional assessments of menus were conducted in five high secure custodial centres in Queensland in a 9 month period between 2006 and 2007. Three centres housed male inmates, with capacities of 988, 600, and 470 beds. A fourth male facility housed 396 inmates in a high secure section, and 100 inmates in a prison farm attached to the facility. The fifth centre assessed was a female high secure centre, with 258 bed capacity. All centres were operating at or close to full occupancy.

On-site reviews were conducted at three centres, with reviews of the remaining two facilities conducted by telephone, fax and email. During onsite visits, meal preparation was observed to verify adherence to standardised recipes, foodservice staff (including inmates) were questioned to clarify usual cooking processes, and food holdings were assessed for quantity and nutritional profile. Meal time observations in inmate units were conducted to verify portioning, food holdings and food wastage. Informal interviews were conducted with custodial staff to verify food wastage and any food issues. In two centres, photography was used to assist in audits, with images taken of meal portioning, food wastage and the nutritional labels on food products (to assist offsite analysis). Data was verified in all centres by review of purchasing records and food complaints logs. Information on foods available through the inmate 'buy-up' scheme was collected for each centre.

Verified menus were analysed using FoodWorks™ nutrient analysis program (Version 5 Professional Edition, Xyris Software 2007), and compared to NRVs. Core food commodities were compared to Australian Guide to Healthy Eating (Smith et al, 1998) and menus were scored against a Food Variety Checklist (Savige et al., 1997).

Ethical considerations

Ethical approval was sought and granted by the Commissioner of the NSW Department of Corrective Services, WA Department of Justice, and Queensland Corrective Services. Full support was given by the management team of each prison concerned with the foodservice departments.

Results

Description of foodservices

In WA, meals are prepared and distributed by a workforce consisting of inmates, who are supervised and trained by qualified chef instructors. Through its Prison Industries, the DoJ produces much of its own fresh produce, including meat, milk, eggs and most fresh vegetables. Most facilities produce their own bakery products, including bread and cakes. A variety of food production and meal systems operate in different facilities. Meal settings vary from self-service meals to plated individual meals, depending on the facility design, numbers of inmates and security rating. Smaller regional centres use cook-fresh systems; larger sites use cook-chill systems. Inmates can purchase food from canteens and the most common items after tobacco were soft drink and chips, noodles and confectionery (Department of Health Western Australia, 2004).

In NSW correctional facilities, a cook-chill food service system is primarily used for the hot evening meal, while the majority of the weekday lunches are fresh items such as sandwiches and salads. Breakfast is provided the previous evening as a pack of food items for inmates to consume in their cells or in the common areas. Corrective Service Industries (CSI) Food Services (a business unit of the Department) manage a food production unit providing meals to inmates in corrective institutions across NSW. Approximately 10,000 cook-chill dinner meals are produced daily, for use at the three facilities in the study and other centres across NSW. Food for other meals is received from other production centres, including sandwiches and bakery items, dairy items, portioned cereals and some prepared vegetables. Chilled meals are assembled on site in foil containers at a central kitchen, for regeneration in convection ovens before distribution as individual meals to inmates.

There are separate Summer and Winter non-selective four-week cycle menus, which also incorporate vegetarian and religious-appropriate dishes if requested. Inmates in NSW are able to purchase up to $60 of additional food from a canteen or weekly ‘buy-up’ list (which also includes toiletries, confectionery and cigarettes, in addition to food items) if they can afford to do so. The most common food items purchased by men are meat, noodles and

eggs. In contrast, the women commonly purchase sweet items such as lollies, biscuits, cakes, chocolate and soft drinks (Butler & Milner, 2003). The style of meal delivery and dining location varies from one correctional centre to another depending on their design. At the facilities in this study, individual meals are delivered to the residential blocks, and are consumed either in a common recreational area for groups of up to 64 inmates (the breakfast and lunch meals), with access to some limited kitchen facilities (refrigerator, toaster, microwave oven, boiling water), or in the inmates' cell after they have been locked in for the night (the evening meal). At some other centres throughout NSW, cafeteria type services provide a choice of food items at point of service.

In Queensland, meals are prepared by inmates who are trained and supervised by qualified chef instructors. Three centres were providing certified vocational training in foodservices for inmates. All centres use a cook fresh system, with four operating a central kitchen (two in one larger facility), and one with an onsite bakery providing all bread products to that centre only. One older style centre also operated a prison farm with all milk, meat, and limited fruits supplied to the centre, this centre also operated a number of satellite kitchens.

Inmates eat all meals in group dining settings, unless circumstances require an individual to be excluded from group settings. Meal service is bulk into units of 28-50 beds, and residential units of 6 beds. Only one female centre provides full cooking facilities to inmates accommodated in residential units, with unprepared food commodities supplied from the central kitchen. Mealtimes in large units are supervised by custodial staff, including the portioning and distribution of meals. Inmates have access to breads, spreads, milk and fruit supplied to the unit throughout the day, and can eat according to need.

A small range of cooking facilities is provided in all units, with toasters, hot water urns, and refrigerators available in large units. In residential style accommodation, electric frying pans or microwave ovens may also be available to reheat foods. Barbeque facilities are available to all units, with access provided according to the menu.

Four to six week non-selective menu cycles are devised similarly between centres, based on a consensus ration scale specifying portions of core food commodities such as meats, breads, vegetables and milk per person. Standardised recipes are written, however in a number of centres some deviation was evident. Special diet meals are provided for inmates with medical or religious dietary requirements, and packaged individually. Menus are modified 6-monthly, with the inclusion of soups in the Winter (except one centre located in a tropical climate), and additional salads in Summer. Menus are reviewed on 1-2 yearly basis by qualified dietitians.

Inmates in all centres have access to 'buy-ups', with usually two thirds of product items being snack foods. Food items include confectionery, tuna, noodles, chips, biscuits and coffee. Fresh meats and eggs are not available for purchase in these facilities, with all food items required to be non-perishable. Inmates can also purchase soft drinks, both regular and low joule from vending machines. In all centres, no foods can be brought into the centre by visitors, due to security requirements.

Menu Analyses

Table 1 gives examples of daily menus from correctional centres in NSW and Qld. The menus demonstrated adequate variety and an apparently good mixture of hot and cold dishes, and raw and cooked ingredients. Due to security concerns – such as the ability of inmates to ferment foods to alcoholic beverages – a number of common food items were not provided on the NSW menus, including juices, citrus fruits and sugar (only artificial sweetener is available). In Queensland juice is available at some centres and citrus fruit always available.

Table 2 shows that the mean number of serves from the core food groups provided by the correctional menus in the three states compare favourably to the recommendations in the Australian Guide to Healthy Eating (Smith et al., 1998). The menus also conformed well with the dietary guidelines for adults (National Health and Medical Research Council, 2003), and generally included a good selection of wholemeal breads and cereals, salad and

low fat choices. The only significant exception were the fruit serves, which were below the target of 2 serves daily in all three States.

The mean dietary variety score for the NSW menus was 32, and Queensland 35, (i.e. providing 32 and 35 different food types per week), which is rated as very good. It should be noted that several of the categories listed in the variety rating tool are prohibited in correctional facilities – for example alcohol and citrus fruits - and others, like crustaceans, could not be expected to be provided within a limited institutional budget. Hence the realistic maximum would be less than the theoretical target score of 57.

Table 3 shows that the total fat provision, and amount of saturated fat, both appear to be significantly lower on the NSW and Qld menus than in WA, but this may be an effect of time, with recent menu reviews leading to reductions in the fat content in both of the first two states.

Detailed nutrient analysis of menus was not undertaken in the WA study, but Table 4 shows results from the NSW and Qld studies. The majority of nutritional requirements were adequately provided. The folate levels, and magnesium and potassium (for men only) in the NSW menus are marginally below current recommendations, but are similar to or better than the mean intakes recorded in the last national nutrition survey (McLennan & Podger, 1998). In the case of Queensland, folate was adequate because of the policy to provide only fortified breakfast cereals.

Like the finding of a recent survey of food in British prisons, the sodium content of the menus in both NSW and Qld was significantly above recommendations, but the levels were not dissimilar to current intakes nationally in the general population (Beard *et al*, 1997). In NSW the kitchens now use low-salt gravy mixes and flavour boosters, and no salt is added during cooking, so sodium levels are likely to be somewhat lower than those reported in 2005. Breads and breakfast cereals alone contributed 1250mg/d to the Qld menus, making it very difficult to achieve the suggested dietary targets. The dietary fibre content of the

menus (31-40g/d for men, 26-28g/d for women) was much better than that reported in the 2006 study in UK prisons (<13g/d) (National Audit Office, 2006).

Focus Groups

Figure 1 shows the number of comments made about each of 16 themes that were indentified in the NSW study. The following summaries explain some of the key concerns and provide exemplar quotes for each.

Food quality

- *It's unappealing, unappetising, quite bland*
- *There's nothing you like, you never look forward to a gaol meal, never*

At the beginning of each focus group participants were asked for general comments about the food services and the majority replied with negative responses. The quality of the food itself was a major issue for many of the inmates, with the taste, texture and appearance being regarded by some as unsatisfactory. Many of the dishes provided were said to be disliked, however exceptions were the yoghurt, dried and fresh fruit, salad packs, roast dinners, and meat pies. Although fruit was liked, the quality was said to be poor, often reportedly being bruised, discoloured or not ripe. Presentation of the evening meal in a foil tray was particularly disliked; it appeared the contents were often mixed together, not allowing inmates to distinguish what was included.

Buy-ups

- *I just can buy some vegetable and Asian food. I cook my own food so I'm okay*
- *Majority of the inmates can't afford it The battlers are the ones that suffer, that don't have no one outside that sends money for buy-ups and they gotta eat the food*

Inmates reported relying heavily on weekly 'buy-up' purchases to supplement their meals. Those who could afford to buy additional foodstuffs preferred to prepare their own meals and eat this rather than what was provided. Tuna, eggs, milk, rice, pasta, sardines and salmon were the most common items bought. There were criticisms about a lack of variety (especially meat), healthy options and fresh produce on the buy-up list. Asian inmates,

reported buying a lot of rice, which is one of the cheaper items, and they requested more Asian foods be available for purchase 'such as the Chinese sausages, pork buns, spring rolls, pork cubes'.

Facilities

Access to adequate facilities for cold storage was limited. Some of the inmates felt that the refrigerators in their common areas were not operating at a low enough temperature to keep items cold, and that there was insufficient capacity to accommodate all of the inmates' food. Stealing from communal refrigerators was also a concern; this led to inmates storing food in their cells, often inadequately (such as wrapping hot food in towels or keeping milk cool in a sink full of water). Facilities for food preparation and cooking were a major concern for the inmates as it appeared that there was a high proportion who cook their own meals.

Serving size

Although the menu analysis indicated that adequate energy was provided in the food given to inmates, the serving sizes of the meals (typically 600-700g) and snacks were generally regarded by inmates as small, particularly by the male inmates. Basic staples such as milk, bread, and tea and coffee were considered insufficient for the day, as well as the single serving of fruit, small cereal packs, and main meals. The quantity of meat in the hot evening meal was a major issue, although the amounts in the recipes appeared to the reviewers to be appropriately generous.

Variety

- *Even if it was good food you'd get sick of it after eating the same food every night*

There were many comments about lack of variety on the four-week cycle menus. However, it was also acknowledged that the menus were improving, and that addition of items such as the dried fruit and yoghurt pack and a hot and spicy chicken burger were welcomed. The inmates did express frustration about not having any personal choice when it came to the actual food, but generally accepted that this was a feature of incarceration that was not going to change.

Waste

High levels of food wastage were reported and inmates suggested that for some meals, particularly the hot evening meal, most of the food was thrown away, although there was no objective data to corroborate this assertion. The fish and seafood dishes were thought to be the meals that were most commonly wasted.

Cooking and Food Safety

The majority of the long-term inmates had purchased a rice cooker to use in their cell. It was reported that many inmates take out components of a meal such as the meat, chicken, potatoes or corn, and wash them to be re-cooked in a rice cooker with other ingredients purchased at 'buy-ups'. This clearly poses a large potential food safety problem, particularly at the remand centre where inmates are locked into their cells at 3:00pm with their hot evening meal. This meal could therefore sit in the cell unrefrigerated for many hours, and then parts of it can be re-used when inmates cook for themselves.

Meal times

In centres A and C the mid-day and evening meals are served at approximately 12:00noon and 3:00pm, because the General Managers have requested that inmate meals be delivered when the maximum number of correction officers are on duty to ensure security measures are maintained. The timing of the final meal was not well accepted by the inmates, although they were aware of the restrictions and the fact that they do not have the luxury of choosing when it is served.

Culture

Cultural 'buy-ups' (with special food items) were available every six months for Asian inmates and once a year for Muslim inmates. Both groups reported they relied heavily on these and would like them to be more frequent. Asians reported that even if the meals included dishes they would traditionally consume, the European way of preparing them was different and they would not eat it anyway. Instead they used foodstuffs obtained through

the ‘buy-up’ to cook a meal. There was some discontent from other inmate groups who felt that it was unfair that Asians and Muslims received additional opportunities to purchase special foods when they did not.

Discussion

The analysis of the menus shows that in general Australian inmates in custodial facilities are being provided with a well varied selection of foods which meets or exceeds the majority of nutritional requirements. This finding is similar to those of a recent survey in British prisons (National Audit Office, 2006). An additional half serving of fruit per day on the WA and NSW menu would be needed in order to meet current Australian guidelines of 2 serves per day, and this would be well accepted by the inmates who requested more fruit in the NSW focus group discussions. However, the high vegetable and salad content of all the menus means that this shortfall is probably nutritionally insignificant, and the nutrients normally important from fruit (such as fibre, vitamin C and folate) seem adequately provided (Table 4).

However the menu analyses for all three states were calculated with the assumption that all of the food provided was eaten by the inmates, whereas some of the focus group participants suggested that a lot of the food was not eaten or was supplemented with food prepared from 'buy-ups'. Furthermore, these studies did not record details of the processing parameters during food preparation and distribution. Consequently the nutritional profile of the food may be less than that calculated, due to nutrient losses during the delays between food production and service, long holding times, and subsequent re-heating, or re-use in cooking. Given the potentially significant degree of food wastage, a quantitative analysis on actual food consumption is needed to assess these issues more completely.

The personal expectations of particular meals or food items, as well as comparisons made with what and how food is eaten and prepared outside of the correctional centre, are likely to have had an impact on the inmates' negative attitude towards the food in the NSW focus groups (Johns & Howard, 1998; Cardello *et al,* 2000). Furthermore, as in many other institutional settings - such as schools or hospitals - complaints about food can become normally expected behaviour, and may reflect general frustrations with a lack of control over surroundings, rather than being an accurate reflection on the quality of the food actually provided. Menus that do not provide favourite commercial fast foods and

indulgences that would be eaten at home are likely to be seen as inferior by many inmates, no matter how well planned. In a UK study conducted with women prisoners, the majority commented that they were dissatisfied with the food service, but acknowledged that the food was not really that unpalatable (Smith, 2002). Studies of menus with more branded food items might improve client satisfaction, as has been found in other settings (Vranesevic & Stancec, 2003).

Comments from the focus groups highlight possible issues of food safety related to the early times at which inmates go to their cells in the evening, which warrant further study. How the inmates are storing food items and meals, and many of their current practices could be posing unacceptable food safety risks, although there did not seem to be any unusual records of food poisoning as a health concern.

In the NSW facilities there does seem to be a commitment to quality improvement and a professional standard of food service, including external audits against ISO9001 standards. The food service manager conducts regular satisfactions surveys with the inmates and has used the results to progressively improve the menu offerings. In 2009, Corrective Services Industries is employing a consultant dietitian to review the master menus. Similarly in Queensland, commitment to improving food and nutrition of inmates is evident, with dietitians employed on staff (rather than just in a consultant capacity) since 2007 to work with foodservices to effect improvements in this regard, and food and nutrition established as separate area within the corporate governance framework.

Conclusions

There are significant differences between the foodservice systems employed to feed inmates, and in the menus used, in correctional facilities in the three Australian states reported in this study. It is not possible from the results presented here to evaluate whether the issues raised in the NSW focus groups from a limited sample of centres were factually based, or whether they simply represent generalised complaints that are unlikely to be able to be addressed. Complaints may be influenced by many factors that are not under the control of the foodservice managers, such as meal times, limitations of foods allowed, and the physical eating environment. As in many institutions, criticism of food becomes normally expected behaviour and cannot be the sole method of evaluation of the quality of the service.

In general however, it appears that there has been a significant improvement in recent years and it can be concluded that inmates are mostly provided with a good standard of food that enables them to consume a healthy and nutritionally balanced diet. Possible areas for future research would be to conduct quantitative measures of food waste, undertake longitudinal studies of inmate nutritional status, conduct more qualitative studies on inmate views in other locations, and examine the feasibility of alternative means of meal delivery (such as provision of uncooked ingredients) that would give some greater sense of control to inmates who wished to undertake their own food preparation.

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Table 1. Examples of inmate menus in NSW and Queensland custodial facilities

	NSW	Qld
Breakfast Pack	7 slices bread (white or wholemeal) Milk: 360mL (men); 500mL (women) 40-45g cereal (various types) Tea, coffee and sweetener 1 portion jam or marmalade 36g margarine (250g per week)	8 slices bread (throughout day, not as a breakfast pack as such), margarine, assorted spreads 600mL (low fat milk) Fortified breakfast cereals (various) Tea, water (artificial sweetener or sugar)
Day 1 (Summer) Midday	Ham, cheese & pineapple roll Celery, gherkin & hommus dip Apple	Sandwiches with cold meat & salad Fruit
Evening	Crumbed fish Potato bake Mixed vegetables Flavoured custard	Chicken chow mien Rice Bread Fruit
Day 2 (Summer) Midday	Savoury cheese sandwich Chick pea salad Pear	Cold roast beef, coleslaw, tomato, Onion Pita bread, fruit
Evening	Chicken cassoulet Hi-fibre rice Corn and peas Apple custard tart	Baked ham, potato, zucchini, carrots, Bread Jellied fruit & ice cream
Day 3 (Winter) Midday	Chicken thigh roll Fruit and yoghurt tray Apple	Tuna & pasta salad Fruit Bread
Evening	Lasagne Tomatoes, corn, green beans Flavoured custard	Roast chicken & gravy, roast potato, Beans, pumpkin, bread Fruit yoghurt
Day 4 (Winter) Midday	Beef and salad sandwich Baked bean tub Banana	Vegetable minestrone Garlic bread Fruit
Evening	Spicy chicken with kumara Pasta shells Bok choy and peas Lamington slice	Lasagne Tossed salad Bread Fruit

Table 2. Comparison of the mean number of serves per day from the core food groups provided by the menus compared to national recommendations

Core food groups	WA 2002	NSW 2005	Qld 2007	Australian Guide to Healthy Eating*
Cereals **	5.6	6.5	6-7	6
Vegetables	5.2	5.7	5	5
Fruit	1.8	1.5	1.5-2	2
Milk	2.8	2.3	2.5-3	2
Meat/Alternatives	3.4	4	5	1

* Minimum number of daily serves for men aged 19-60years to achieve a healthy diet (Smith et al., 1998)

** Note: in the AGHE one cereal serve is 2 slices bread, 1 cup of cooked pasta or cereal, and 1.3 cups of ready to eat breakfast cereal.

Table 3. Comparison of the daily total and saturated fat provided (mean of Summer and Winter menus)

	WA 2002	**NSW 2005**	**Qld 2007**	**Recommended level** (National Health and Medical Research Council, 2006)
Total fat (g)	130	107.7	95	112 max*
Saturated fat (g)	70.5	40.4	32	35 max*
% Energy from fat	n/a	36.1	30	20-35
% Energy from saturated fat	n/a	13.5	10	≤ 10
% Contribution of saturated fat to total fat	54.2	37.5	33.6	≤ 35

* based on requirements of 19-30yr male, with energy requirements of 11.8MJ
n/a data not available

Table 4 Mean nutrient provision from menus in the NSW and Queensland facilities*

Calculated provision	NSW men	Qld men	RDI (or SDT) men **	NSW women	Qld women	RDI (or SDT) women
Energy (MJ) ***	11.54	11.8	10.3-13.3	11.31	9.8	8.4-10.8
Protein (g)	122	125	64	116	110	46
Fat (g)	111	95	-	110	75	-
Carbohydrate (g)	315	340	-	310	300	-
Dietary Fibre (g)	31	40	30 # (38)	28.6	26	25 # (28)
Vit A eq (µg)	1424	1745	900 (1500)	1407	1750	700 (1220)
Thiamin (mg)	2.3	2.5	1.2	2.2	2.3	1.1
Riboflavin (mg)	2.4	2.6	1.3	2.5	2.8	1.1
Folate (µg)	293	485	400 (300-600)	286	480	400 (300-600)
Vitamin C (mg)	80	140	45 (220)	73	127	45 (190)
Calcium (mg)	1115	1370	1000	1241	1200	1000
Sodium (mg)	4747	5020	460-920 # (1600)	4441	3300	460-920 # (1600)
Potassium (mg)	3440	4430	3800 # (4700)	3415	3790	2800 # (4700)
Iron (mg)	16.7	19	8	15.4	17	18
Zinc (mg)	16.5	16	14	14.8	16	8
Magnesium (mg)	366	460	400	357	320	310

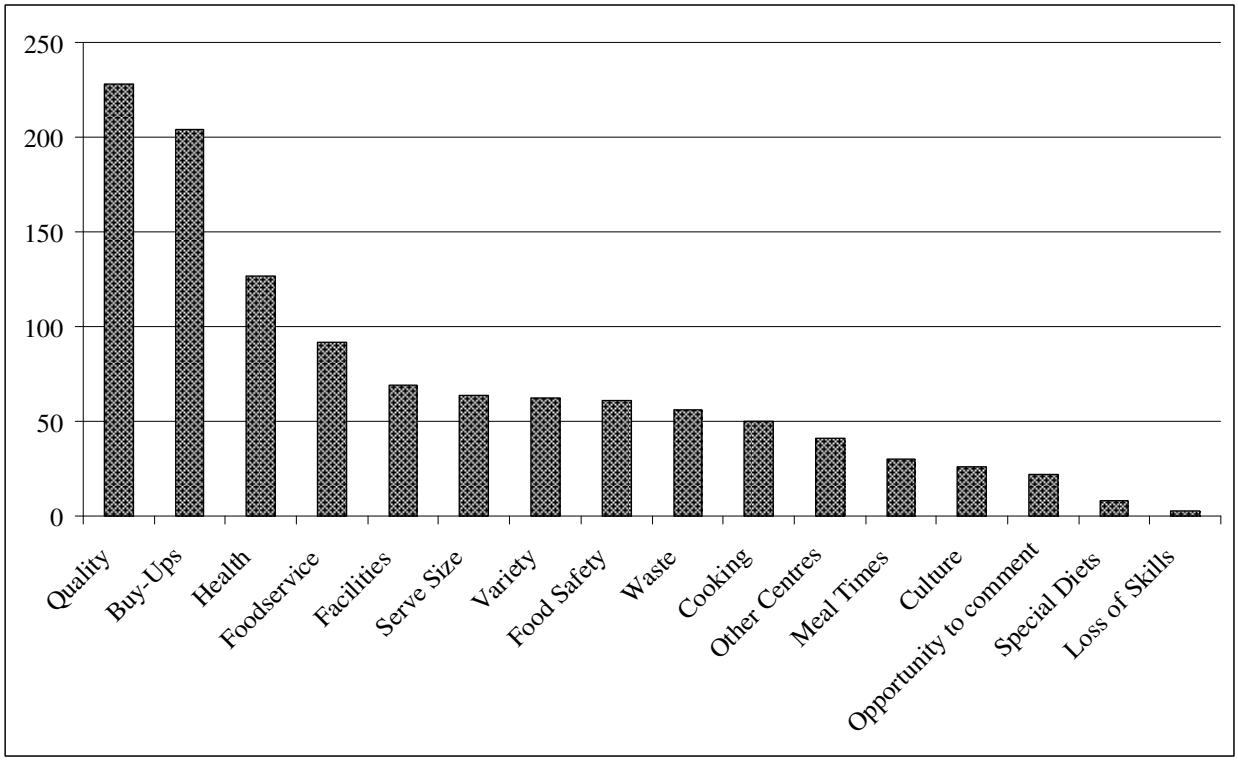
* NSW data is based on average of Summer and Winter menus with values of the full diet options with white bread. Qld analyses include folate from fortified cereals and include sodium from optional sauces (620mg/d)

** RDI (Recommended Dietary Intake) or estimated AI (Adequate Intake) for men and women aged 19-30y. SDT (Suggested Dietary Targets) are higher intakes of some nutrients, suggested to reduce the risk of chromic disease (National Health and Medical Research Council, 2006)

*** Mean age of inmates is 33yrs (Australian Bureau of Statistics, 2007). Conservative estimate based on 19-30 yrs, PAL 1.4-1.8: 10.3-13.3MJ (males), 8.4-10.8MJ (females)

AI only = median intake of normal healthy population

Figure 1: Frequency of comments made by focus group participants about 16 key themes



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