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Food service trends in New South Wales hospitals, 1993-2001

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Food service trends in New South Wales hospitals, 1993-2001

Abstract

A survey of the food service departments in 93 hospitals throughout NSW Australia (covering 51% of hospital beds in the state) was conducted using a mailed questionnaire and the results compared with those from similar surveys conducted in 1986 and 1993. Over the past eight years there has been a significant increase in the proportion of hospitals using cook-chill food service production systems, from 18% in 1993 to 42% in 2001 ($p < 0.001$). Hospitals with cook-chill systems had lower staff ratios than those with cook-fresh systems (8.3 vs 6.4 beds/full time equivalent staff; $p < 0.05$), but there was no significant difference in the ratio of meals served per FTE. There was no difference between public and private hospitals in terms of ratios of beds or meals to food service staff. Managers using cook-chill systems reported significantly lower levels of satisfaction with the food service system compared to those using cook-fresh. Two aspects of the services have not changed since the last survey: approximately a quarter of food service departments are still managed by staff without formal qualifications and meal times remain the same, with more than 90% of hospitals serving the evening meal before 5.30pm and a median of 14.25 hours gap between the evening meal and breakfast.

Keywords

food service, hospitals, cook-chill

Disciplines

Arts and Humanities | Life Sciences | Medicine and Health Sciences | Social and Behavioral Sciences

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Title: **FOOD SERVICES TRENDS IN NEW SOUTH WALES
HOSPITALS, 1993-2001**

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Key words: food service, hospitals, cook-chill

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Running Title: Trends in NSW hospital food services

2 **Abstract**

3 A survey of the food service departments in 93 hospitals throughout NSW Australia
4 (covering 51% of hospital beds in the state) was conducted using a mailed questionnaire and
5 the results compared with those from similar surveys conducted in 1986 and 1993. Over the
6 past eight years there has been a significant increase in the proportion of hospitals using
7 cook-chill food service production systems, from 18% in 1993 to 42% in 2001 ($p < 0.001$).
8 Hospitals with cook-chill systems had lower staff ratios than those with cook-fresh systems
9 (8.3 vs 6.4 beds/full time equivalent staff; $p < 0.05$), but there was no significant difference in
10 the ratio of meals served per FTE. There was no difference between public and private
11 hospitals in terms of ratios of beds or meals to food service staff. Managers using cook-chill
12 systems reported significantly lower levels of satisfaction with the food service system
13 compared to those using cook-fresh. Two aspects of the services have not changed since the
14 last survey: approximately a quarter of food service departments are still managed by staff
15 without formal qualifications and meal times remain the same, with more than 90% of
16 hospitals serving the evening meal before 5.30pm and a median of 14.25 hours gap between
17 the evening meal and breakfast.

18

2 **Introduction**

3 These are difficult times for hospitals and other health care related services. Health care
4 administrators who are forced to balance budget constraints with the ever increasing demand
5 for service provision are seeking ways to increase efficiencies and reduce costs.

6 Compounding this challenge is the demand to provide quality service to their customers.
7 Consequently in healthcare food service many changes are occurring, including increased use
8 of computer-based information processing and new technologies for food production and
9 distribution. Yet there are few studies that have attempted to track these trends.

10

11 In 1986, the first extensive survey of the food service systems used in 276 hospitals in New
12 South Wales (NSW), Australia was conducted (Williams & Brand 1988). Seven years later a
13 repeat survey in 159 hospitals revealed that there had been a significant increase in the
14 proportion of these hospitals using cook-chill food service systems, from 5% in 1986 to 18%
15 in 1993 (Dunn & Williams 1994). Since then the trend to use centralised cook-chill food
16 production units for multiple healthcare facilities has continued. This study was undertaken to
17 resurvey NSW hospitals to collect information on the current food service systems being
18 used. In particular the aims were:

- 19 1) to describe the current food service systems in use
- 20 2) to compare the efficiency of the different food service systems in terms of two ratios: beds
21 per full time equivalent staff and number of meals served per full time equivalent staff, and
- 22 3) to establish the managers' level of satisfaction with their food service systems.

23

24

2 **Methods**

3 A postal survey was mailed in August 2001 to the food service managers in hospitals
4 throughout New South Wales. NSW is the largest state in Australia, with approximately one
5 third of the total national population. Names and addresses were obtained from the Australian
6 Hospital Directory (Anonymous 2000). All types of public and private hospitals were
7 surveyed (medical, surgical and psychiatric), excluding those that were solely day surgeries -
8 where patients did not stay overnight - and those that were exclusively for pediatric patients.
9 In total there were 189 public hospitals and 81 private hospitals included.

10

11 The 25-item survey questionnaire was based on that used in the 1993 survey (Dunn &
12 Williams 1994) with some additional questions to measure the managers' satisfaction with
13 the food service systems. Copies of the questionnaire are available from PW. Four weeks
14 after the first mailing, a second questionnaire and follow-up letter were sent to hospitals not
15 responding to the first mailing. The questionnaire sought the following information on
16 hospital food service departments:

- 17 • Size, name and staffing of departments
- 18 • Food production and distribution systems
- 19 • Client type
- 20 • Meal times
- 21 • Menu type
- 22 • Department head's satisfaction with the system in use

23

24 The Statistical Package for the Social Sciences for Windows (version 10.0, SPSS, Chicago,
25 Ill, 2000) was used for all data analysis. The satisfaction levels with current food production
26 systems were rated using a 10-point scale (1= very dissatisfied to 10= very satisfied). Staffing
27 ratios were expressed as numbers of meals served or numbers of hospital beds per full time
28 equivalent (FTE) of food service staff (where one FTE works 38 hours per week). Unpaired
29 two-sided Student t-tests were used to compare efficiency ratios and satisfaction levels
30 between the food service systems. Chi-square analysis was used to indicate whether any
31 significant differences existed between the proportions of hospitals using current foodservice
32 systems and those reported in 1993 and between hospitals of different sizes. The study was
33 approved by the University of Wollongong Human Ethics Research Committee.

34

2 **Results**

3 A total of 93 food service managers (34%) responded to the questionnaire, the majority
4 (76%) of them being from public hospitals (Table 1). These responses covered 51% of the
5 26 075 hospital beds in NSW hospitals (56% of the public hospital beds and 33% of the
6 private hospital beds).

7
8

9 *Qualifications of the head of department*

10 The reported qualifications of the person in charge of the hospital foodservice departments
11 are listed in Table 2 along with the comparisons from the 1993 survey. There was no
12 significant difference in the proportion of qualified staff reported in this survey compared to
13 that reported in 1993 and still one quarter of food service managers have no formal
14 qualifications. The majority (60%) of managers without any formal qualifications were found
15 in the smaller hospitals with less than 100 beds. Department heads in 44% of the larger
16 institutions (>100 beds) had qualifications in hotel and catering/hospitality management
17 compared to only 16% in the smaller hospitals.

18

19 In this study, no food service department was headed by nursing staff, unlike in the 1993
20 survey where it was found that they managed 4.5% of the hospital departments. Dietitians
21 were in charge of food service departments mainly in hospitals of more than 100 beds; they
22 managed the food service in 9.4% of those hospitals.

23

24

25 *Food service systems used*

26 In 1993, the conventional cook-fresh food service system was the most prevalent, found in
27 81% of hospitals in NSW. As shown in Table 3, there has been a significant decline in the use
28 of this system in the past eight years. At the same time, the use of cook-chill systems has
29 increased significantly from only 17.8% hospitals in 1993 to 41.7% in 2001 ($p<0.001$).

30

31 The type of system used varied according to the size of the hospital. Cook-chill systems were
32 found in hospitals of all sizes, although they were more common in hospitals with 100 beds
33 or more (62.3%) compared to only 19.1% of those with less than 100 beds. The use of the
34 chilled food production system was more evident in the public sector. Only 4.4% of the
35 private hospitals used a cook-chill system.

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Managers in 19.8% of hospitals reported that they had changed their meal service systems within the past five years while 8% reported they had the same system in operation for more than 20 years and 15% had never changed their system of operation.

Meal Plating / Food assembly

In 89.3% of the hospitals the patient meals were plated in a central location, i.e. in a main kitchen rather than at ward level (Table 4). This proportion has not changed significantly since the 1993 survey. Centralised meal plating was used in all private hospitals and in 85.7% of public hospitals. Decentralised plating was more common in larger hospitals, but not significantly so. A small percentage (2.6%) of the public hospitals plated their meals both in the kitchen and at ward level.

Meal Distribution

The different methods of maintaining food temperature during patient meal delivery are listed in Table 5. The most common system in use was the insulated cover and base (34.5% of all hospitals), followed by the heated pellet system (20.9%), though this proportion has dropped from the 29% reported in 1993.

Almost all managers from hospitals with less than 100 beds (91.4%) reported portioning hot food items for patient trays in the kitchen and delivering to patient floors, compared to 80% in hospitals with 100 beds or more. In 13.9% of the hospitals food items were portioned cold in the kitchen and reheated in patient ward areas.

Half of the hospitals with chilled meal service reheated their food using convection ovens, although smaller proportions used microwave ovens, infrared ovens and conduction heating systems (Table 5). The use of infrared ovens has decreased substantially on the past seven years and in this study 3.8% of the hospitals reported using microwave ovens, something not reported in the 1993 survey. In 78.2% of hospitals food was reheated on individual plates and 21.8% it was reheated in bulk.

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Where meals are eaten

In 82% of hospitals patients ate their meals in or at their bedside. One percent of the public hospitals provided dining rooms or other areas away from the ward. This practice was not reported in any of the private hospitals. In 17% of hospitals, patients could have their meals at their bedside or in the dining area. There was no significant relationship between the place meals were eaten and the hospital size or the type food service system used.

Staffing levels

The overall ratio of staffing levels in the departments was 7.3 beds/FTE and varied from as low as 2.0 to a maximum of 33.8. This value was not significantly lower than the mean value of 7.7 beds/FTE reported in the 1993 survey. There was no correlation between staffing ratios and hospital size, but public hospitals with a mean (\pm SD) of 7.4 ± 4.3 beds/FTE reported a slightly higher ratio than private hospitals, with a mean of 6.9 ± 2.9 . This difference was not statistically significant. This shows a change from the previous two studies in 1986 and 1993, when the private hospitals, and especially those with less than 100 beds, were found to have a significantly higher bed/staff ratio than public hospitals.

Hospitals using a cook-chill food service system had a significantly higher ratio of beds/FTE compared to departments with traditional cook-fresh systems: 8.3 ± 5.2 vs 6.4 ± 2.4 beds/FTE ($p < 0.05$).

Only 74 hospitals (80% of the sample) provided information on the number of meals served to their various clients. The overall ratio was 566 ± 340 meals per month/FTE, varying from as low as 94 to a maximum of 1631. The ratio in the private hospitals was not significantly different to that in public hospitals. More meals/FTE were served by hospitals using the cook-chill system (655 ± 341) than those using the cook fresh system (545 ± 328), but not significantly so. In some hospitals, the food service department did not manage meal delivery staff. These hospitals were excluded in the analysis of the ratios of meals/FTE staff.

2 *Client types*

3 Table 6 sets out the proportion of patients requiring special diets in public and private
4 hospitals of five size categories. Special diet meals made up a greater percentage of the meals
5 in the larger hospitals especially in the public sector. However, unlike in the 1993 survey
6 where this percentage was significantly higher in the public hospitals, in this study there was
7 no significant difference in the proportion of special diets between the private sector and
8 public hospitals. From 1993 to 2001 there was no significant change in the mean percentage
9 of patients requiring special modified diets (16%). The range of the proportion of special
10 diets was wide, from as low as 1% to as high as 65%. This may have been due in part to
11 differing interpretations of what a special diet was, since this was not defined in the
12 questionnaire.

13

14 When asked whether the facility provided food to other food service establishments, the
15 managers' responses showed that this activity was more common in the public hospitals.
16 Only 9% of the private hospitals supplied Meals-on-Wheels (MOW). By contrast, 55.7% of
17 the public hospitals did so, but this represented a 15% decrease from the value reported in
18 1993. 84.6% of public hospitals with less than 50 beds supplied food to MOW compared to
19 63.6% of those with 50-99 beds and 32.1% of those with 100 beds or more. This pattern is
20 quite similar to that reported in 1993.

21

22

23 *Menus*

24 Table 7 compares the length of cycle menus used in hospitals in 1993 and 2001.

25 All hospitals that responded reported using a fixed cycle menu; none reported using a
26 restaurant-style or other menu type. There was a 6% non-response rate to this question.

27

28 The most significant change is that the use of shorter menu cycles (<14 days) has become
29 more common (16.2% of hospitals in 2001). This is opposite to the trend that was reported
30 between the previous two surveys: in 1986 the value was 14% and fell to 6.5% in 1993. In
31 2001 the 14-day cycle was the most common, found in half of all hospitals. The 21-day cycle
32 was found in 16% of the hospitals and 13.9% used a 7-day cycle period. Few hospitals
33 (5.1%) used cycles based on lengths other than multiples of one week e.g. 8, 10 or 15 days.

34

2 In 91% of the hospitals, patients selected their own menus. In the remaining 9% the patients
3 were helped to select their meals by staff, mainly the nursing personnel or diet aides. A paper
4 menu selection system was used in 88.4% of the hospitals but 5.8% hospitals used the
5 bedside computer entry and another 5.8% used other systems such as computer selection of
6 menu choices made on behalf of patients, based on their food preferences and diet
7 requirements.

8
9 Managers were asked how far in advance patients were required to make their menu
10 selections. In both public and private hospitals, 70.6% patients selected their meals 12-24
11 hours in advance. The next most common response was 24-48 hours, found in 20% of the
12 public hospitals (mainly those with over 100 beds), compared to only 4.5% in the private
13 hospitals. The second most common response from the private hospitals was less than 12
14 hours, found in 18% of these hospitals. In only 8.6% of the public hospitals was it reported
15 that patients selected their meals less than 12 hours in advance, mainly in the smaller
16 hospitals.

17 18 19 *Meal times*

20 Table 8 shows the median serving times of meals and the range of times at which they are
21 served. Where meal service in a hospital extended over a period of time the midpoint was
22 chosen for the purpose of analysis. There was no significant difference between public and
23 private hospitals in the times at which meals were served.

24
25 Only 19% of the hospitals provided an early morning beverage, the majority of them being
26 the smaller hospitals (those with less than 100 beds). Most hospitals regularly provided
27 patients with other mid-meals: 98% serve morning tea, 99% serve afternoon tea, and 95%
28 serve supper.

29
30 Most hospitals began serving the breakfast meal between 7am and 8 am. The midday meal in
31 a majority of the hospitals was served between 12.00 noon to 12.30pm. The evening meal
32 serving times were spread over two and a half hours from 3.30pm to 6.00pm with most meal
33 service being between 5.00pm and 5.30pm. The median time between the evening meal and
34 breakfast was 14.25hours.

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Managers' level of satisfaction with food service system

Table 9 provides information on the managers' level of satisfaction with the foodservice system. Satisfaction was rated using a 10-point scale. Ratings of 7-10 indicated that the managers were satisfied with the system while ratings of 1-4 indicated low levels of satisfaction. Overall, there was a significantly lower level of satisfaction reported by managers using the cook-chill system compared to those using the cook-fresh system ($p < 0.001$). The lowest level of satisfaction was found amongst managers in hospitals of 100-249 beds using the cook-chill system (rating of 5.6 ± 2.1).

2 **Discussion**

4 *Qualifications of management*

5 In the US, it has been recommended that a bachelor degree should be a minimum
6 qualification for managers of hospital food and nutrition services (Dowling *et al.* 1990). In
7 Australia, the Australian Council on Healthcare Standards requires that services should be
8 directed by a person appropriately qualified by education, training and experience and that
9 sufficient numbers of qualified personnel and support staff are employed to allow for the
10 efficient operation of the service (Australian Council on Healthcare Standards 1992).
11 Catering or food service management qualifications are desirable (Institute of Hospital
12 Catering NSW 1997) but are not mandated. Compared to results from the 1986 NSW hospital
13 survey, when it was found that almost half of the managers of food service departments had
14 no formal qualifications, there has been a significant improvement in the proportion of
15 appropriately qualified food service managers. This could be due to an increase in the overall
16 level of training among departmental heads now employed but may also be due to a reduction
17 in the number of smaller hospitals in NSW, which have the highest proportion of unqualified
18 food service managers. However, the proportion of unqualified managers has not declined
19 since the 1993 survey and remains unacceptably high at around 25%.

22 *Food service systems*

23 Over the past eight years, there has been a significant 23.9% increase in the proportion of
24 hospitals using the cook-chill food service system, most of which occurred over the past five
25 years. Cook-chill is not a new system. Its use has been widespread in Europe and in North
26 America (Greathouse & Gregoire 1988) (Fusco 1988). The findings in this survey that the
27 majority of conventional food service systems are used in hospitals with fewer than 100 beds
28 are consistent with those of Greathouse & Gregoire (1988). They also reported that as
29 hospital size increased, the use of conventional systems seemed to decrease and the use of
30 cook-chill systems increased. The conventional cook fresh system remained the primary
31 choice for hospital foodservice in the USA in the early 1990s, although an increasing number
32 of food services were converting to cook-chill.

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Meal assembly and plating

Up until the 1950s the great majority of Australian hospitals employed a conventional production system with a decentralised hot bulk service system (using either mobile bain-maries or insulated containers) and nursing staff served the food to patients in the ward (McDonald 1984). Since then there has been a growing trend to centralise services and to experiment with alternative meal production systems such as cook-chill and cook-freeze which can utilise fewer staff for the cooking and plating of patient meals. Central plating permits better control of food quality, portion size and diet modifications (Hysen & Harrison 1982). This study confirms the continued use of centralised meal service in the great majority of hospitals of all sizes.

There are potential problems with the trend to centralised plating. In at least one hospital food waste was reported to be higher with a plated system compared to a bulk system of meal provision (Kelly 1999) and a few recent studies have suggested that patient care by nurses may be better when they are involved with ward level food service (Carr & Mitchell 1991; Kelly 1999). However attempts to compare patient satisfaction with different delivery systems has not found any consistent relationship (Lambert *et al.* 1999).

Meal delivery systems

There were no significant changes between 1993 and 2001 in the types of hot food delivery in hospitals using the conventional cook-fresh food service system. More significant changes have occurred with the systems used to reheat chilled meals. There is no evidence that these trends relate to the performance characteristics of the technologies. The first cook-chill systems marketed in Australia used infra-red reheating, and this system dominated in the hospital sector in previous surveys. With an increase in the number of equipment suppliers now offering alternative systems, a greater range of reheating systems is employed, and convection heating systems are now the most common. Few hospitals use microwave ovens; they have been reported to have substantial problems of reliability and uneven performance in large institutions (Ollsson & Thorsell 1984).

2 *Menu type*

3 The trend in Australian hospitals over the past decade has been to develop a single cycle
4 menu that accommodates as many special diet requirements as possible. Paper menu
5 selections remain the most common system used, although with a move to the general
6 introduction of the CBORD suite of computerised food service management systems in NSW
7 (under a Department of Health contract) there are more examples of alternative systems such
8 as bedside order entry - where diet aides record patient selections into palm top computers
9 (Golley 1999) - or doing away with menus and providing a choice of plated meals at point of
10 service, like airline meals (Kokkinakos & Ravens 1999).

11

12

13 *Meal times*

14 There has been little change since 1986 in the times at which patient meals are served.
15 Evening meals are still served earlier than the times most people normally consume this meal
16 at home, and if anything there is a trend to earlier evening meals. In 1996, 12 percent of
17 hospitals served the evening meal after 5.30pm. In 1993 this proportion was 9.5 per cent and
18 in this latest survey it had dropped again to only 8.1%. The median time between the evening
19 meal and breakfast (14.25 hours) exceeds the recommended maximum of fourteen hours
20 (Institute of Hospital Catering NSW 1997).

21

22

23 *Efficiency*

24 Comparisons of the staffing levels in food service operations between hospitals can be
25 notoriously difficult, since in many instances basic tasks (such as food purchasing or meal
26 delivery) may be carried out by staff from other departments. It would therefore be unwise to
27 draw too many conclusions from the self reported data on staffing levels presented here.
28 Nonetheless, it appears that there has not been a significant change in the food service
29 staffing ratios from those reported in 1993. In this current study, hospitals with cook-chill
30 systems had significantly higher ratios of beds/FTE than those with conventional cook fresh
31 systems. However, this is only a crude indicator of efficiency, because it does not take into
32 account bed occupancy rates, proportions of day-only patients, diet types or differences in the
33 ratio of staff to patient meals. The number of meals served per FTE may be a better indication
34 of efficiency and is one of the most commonly used performance benchmarks (Johnson and

2 Chambers 2000). In hospitals using the cook-chill system this ratio was slightly greater than
3 in those using the cook-fresh system but not significantly so.

4
5 Several investigators have suggested that changing from a conventional to a cook-chill or
6 cook-freeze system allows cost savings because food production and service are separated
7 and thus all cooked food items can be produced in an 8-hour day, 5 days a week, allowing for
8 more effective employee scheduling (Herz & Souder 1979; Barnett & Murray 1983;
9 Sobelman 1986; King 1991). However, our results on meals served per FTE are consistent
10 with those from a study by Greathouse & Gregoire (1988) which found that, in general,
11 managers of conventional and cook-chill systems are employing similar resources to achieve
12 their objectives. The lack of significant differences those authors reported between systems
13 with regard to critical variables such as FTE, turnover rate, absenteeism rate and salaries,
14 suggest that food service directors expecting savings in personnel costs by installing cook-
15 chill systems need to be certain that reductions in those areas can be realised. In the UK
16 Cook-Chill Survey nearly one third of those organisations who introduced cook-chill to
17 reduce overall costs failed to achieve that aim (Light & Walker 1990).

18 19 20 *Managers' satisfaction with the food service system*

21 Operational differences between conventional and alternate food service systems have been
22 studied in the past but only limited attention has been devoted to the satisfaction of managers
23 with the systems they use. In this study it was noteworthy that despite increasing use of cook-
24 chill systems, lower levels of satisfaction were reported by managers with these systems
25 compared to those using cook-fresh systems. Although the survey did not attempt a
26 quantitative investigation of the reasons for the satisfaction ratings, some of the issues raised
27 in comments about the cook-chill system from the respondents give an insight into their
28 concerns:

- 29 • High capital costs
- 30 • Higher ongoing maintenance costs
- 31 • Increased requirement for rigorous and complex quality assurance procedures
- 32 • Reduced flexibility (because of plating further ahead of meal times)
- 33 • Communication problems between central production units and remote meal distribution
34 sites

- Poor food quality

This study did not collect data on patient reactions to meals from the different food service systems. However, a comment by one of the managers in this study raised the question of patient satisfaction with the cook-chill system:

“Cook-chill is a costly unprofessional system. Whoever thought of it knows absolutely nothing about food service and does not care about customer satisfaction.”

This comment may also reflect frustration about a lack of control that many food service managers feel regarding decisions to introduce new catering technologies such as cook-chill, which are often driven by senior hospital managers who are solely concerned with economic considerations. A US survey of 126 food service directors that found that managers of cook-chill systems reported lower production costs but also lower patient satisfaction, compared to directors of conventional food services (Nettles & Gregoire 1996). King (1991) also reported a 71% favourable score for patient satisfaction with the cook-fresh systems compared to only 50% with the cook-chill systems. These results suggest that cook-chill systems need to be managed carefully in order to match the positive perception among patients that the cook-fresh system has.

Not all managers in our survey expressed negative opinions. Those working in hospitals in more remote rural areas were concerned about the lack of availability of quality produce and would prefer to change to a cook-chill system, believing that it could be more flexible and provide a more consistent service to their clients.

The cook-fresh system is still considered most effective where the labour supply is adequate and of relatively low cost, where sources of food supplies are readily available, and when adequate space is allocated for food service equipment and activities (Payne-Palacio & Theis 2001). From a nutritional point of view it is also superior in most settings, unless food has to be held hot for very long periods of time (Williams 1996).

2 **Conclusion**

3 The technologies used in hospital food services in NSW continue to change rapidly and there
4 has been a major shift to the greater use of cook-chill systems over the past eight years. Data
5 from this survey do not provide support for the belief that hospitals using cook-chill are
6 necessarily operating more efficiently, and there is some evidence that managers of cook-
7 chill services are less satisfied with the system than those managing conventional cook-fresh
8 operations. There is still further room to increase the proportion of food service managers
9 with appropriate qualifications and to review the times at which meals are served, particularly
10 to reduce the length of time of the overnight gap between meals.

11

References

- Anonymous (2000). *The Australian Hospitals Directory*. ATA Professional Services: North Sydney.
- Australian Council on Healthcare Standards (1992). *The ACHS Accreditation Guide: Standards for Australian Healthcare Facilities*. Australian Council on Healthcare Standards: Sydney.
- Barnett W & Murray I (1983). Cook chill cuts costs, not quality. *Health Care* **25**(3): 16-18.
- Carr E & Mitchell J (1991). A comparison of the mealtime care given to patients by nurses using two different meal delivery systems. *International Journal of Nursing Studies* **28**: 19-25.
- Dowling R *et al.* (1990). Credentials and skills required for hospital food and nutrition department directors. *Journal of the American Dietetic Association* **90**: 1535-1540.
- Dunn G & Williams P (1994). Food service trends in NSW hospitals, 1986-1993. *Australian Health Review* **17**: 106-124.
- Fusco L (1988). Cook chill: no catering panacea. *Health Services Journal* **98**(5087): 185.
- Golley P (1999). Bedside menu entry at Royal Prince Alfred Hospital. *Proceedings of the 2nd South West Pacific Nutrition and Dietetic Conference*. New Zealand Dietetic Association, Auckland: p37.
- Greathouse K & Gregoire M (1988). Variables related to the selection of conventional, cook-chill and cook-freeze systems. *Journal of the American Dietetic Association* **88**: 476-478.
- Herz M & Souder J (1979). Preparation Systems Have Significant Effect on Costs. *Hospitals* **53**(1): 89-92.
- Hysen P & Harrison J (1982). State-of-the-Art Review of Health Care Patient Feeding Systems. In: *Hospital Patient Feeding Systems* (ed. National Research Council) National Academic Press: Washington, DC.
- Institute of Hospital Catering (NSW) (1997). *Food Service Guidelines for Healthcare*. Institute of Hospital Catering Ltd: Sydney.
- Johnson B & Chambers M (2000). Foodservice benchmarking: Practices, attitudes, and beliefs of foodservice directors. *Journal of the American Dietetic Association* **100**: 175-180.
- Kelly L (1999). Audit of food wastage: differences between a plated and bulk system of meal provision. *Journal of Human Nutrition and Dietetics* **12**: 415-424.

- 2 King P (1991). Reaping the Benefits of Construction. *Food Management* **26**(1): 42-49.
- 3 Kokkinakos M. & Ravens J (1999). Who needs patient menus when you have CAPoS?
4 *Proceedings of the 2nd South West Pacific Nutrition and Dietetics Conference*. New
5 Zealand Dietetic Association, Auckland: p39.
- 6 Lambert L *et al.* (1999). Are new meal distribution systems worth the effort for improving
7 patient satisfaction with foodservice? *Journal of the American Dietetic Association*
8 **99**: 1112-1114.
- 9 Light N & Walker A (1990). *Cook-Chill Catering: Technology and Management*. Elsevier
10 Applied Science: London.
- 11 McDonald F (1984). Food Service Systems. In: *Food Service Systems in Hospitals. Seminar*
12 *Report No21*. Hosplan: Sydney.
- 13 Nettles M & Gregoire M (1996). Satisfaction with foodservice directors after implementation
14 of a conventional or cook-chill foodservice system. *Journal of Foodservice Systems* **9**:
15 107-115.
- 16 Ollsson T & Thorsell U (1984). Problems in Microwave Reheating of Chilled Foods. *Journal*
17 *of Foodservice Systems* **3**: 9-16.
- 18 Payne-Palacio P & Theis M (2001). *West and Wood's Introduction to Foodservice*. Prentice
19 Hall: Upper Saddle River, NJ.
- 20 Sobelman R (1986). Food Production Systems: Selecting the Best Alternative. *Hospital*
21 *Material Management* **11**(4): 17-20.
- 22 Williams P (1996). Vitamin retention in cook/chill and cook/hot-hold hospital foodservices.
23 *Journal of the American Dietetic Association* **96**: 490-498.
- 24 Williams P & Brand J (1988). Food Service Department in New South Wales Hospitals - A
25 Survey. *Australian Health Review* **11**: 21-39.