PLANNING THE PATIENTS CATERING
SERVICE FOR A NEW HOSPITAL

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KING EDWARD'S HOSPITAL FUND FOR LONDON

THE HOSPITAL CENTRE

THC 71/588

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PLANNING THE PATIENTS CATERING SERVICE FOR A NEW HOSPITAL

Because new hospitals can only be planned on proven catering service systems this paper deals primarily with distribution systems based on conventional cooking methods, although at the end reference is made to frozen and chilled meals.

Further the findings of the Salmon report which are gradually being introduced to all hospitals must influence the decision on the distribution and service to be adopted. However in coming to a decision the cost in staffing must also be taken into consideration as it must be realised that relieving nurses of the plating and serving of food other staff must be employed to do this work. Therefore it must cost more overall in staff than previously even though it may be done more efficiently.

The Bulk Trolley Service although a reasonably suitable service where nurses were serving the meals is not recommended today now that catering staff are providing a direct service to patients. It is considered to be too costly in staff and with a selective menu can result in a good deal of food being wasted. Therefore at present there are three systems which, if correctly operated and well managed, will provide a good standard of feeding with the level of menus as shown in the Appendix 1 at an acceptable cost.

1 Central Tray Service

2 Central Plate Service

3 Peripheral Finishing Kitchen Service

CENTRAL TRAY SERVICE

There are five central tray service systems in the country at present:

1 Ganymede, known sometimes as Dri-heat
2 Stellex
3 Helitherm
4 Finessa
5 Twin Tray

In general all these central tray services operate on similar lines as set out in the following paragraphs.

Fully Selective Menu Organisation

A menu for each patient is sent to the wards for the patients to select the foods preferred. The amount of time in advance of the meal that the patient has to make the selection will vary from 4 hours to 24 hours depending on the internal administrative organisation and method of forecasting kitchen production. The menus are usually in three sections covering breakfast, dinner and supper and these are returned to the catering department for diet analysis and quantity summarising. An example is shown in Appendix 1

The patient is able to indicate whether large or small portions are required by marking the menu in an appropriate section. Special diets are indicated by the ward sister and a colour coding stamp is later affixed to the menu card at the analysis and summary state. The special diet patients' menu cards can then be forwarded to the dietitian.

Operation

Food is served on to plates by catering staff from mobile bain maries sited at each side of a conveyor belt along which the trays travel. Thus a complete trayed meal including cutlery, bread, condiments, serviettes and all accompanying china can be assembled centrally under the caterer's control. Beverages are not usually added at this stage, but can be if so desired.

The meals are then despatched in the purpose made trolleys, or by an automated transportation system to the wards and all that remains is for the ward staff to hand the trays to patients.

Speed of Service

Completed meals can be obtained at the rate of eight per minute off a well organised unit. It is claimed that up to ten a minute can be obtained by some systems in an ideal layout and with limitation on choice but with a fully selective menu as indicated in the appendix, it will be difficult to achieve eight per minute for a full hour's service.

Meal Times

Because of the length of time it takes to assemble all the meals in a large hospital the first patient would probably receive his dinner at 11.50 a m and the last one at 1 p m. The organisation of the tray service should be such that the ward which received the first breakfasts also receives the first dinners and suppers and the rota throughout the hospital arranged accordingly.

Effect on Meal Production

The natural staggering of meal times provides the opportunity to cook food nearer the time of consumption and permits batch preparation and cooking processes to be undertaken in the kitchen. In large hospitals cooking can even continue whilst the meals are being despatched to the wards.

Effect on kitchen design and equipment

The effect of a staggered meal service and batch cooking is to reduce the number of boiling pans, steaming ovens and ranges which would otherwise be required, but more important the capacity of pans and ovens can be reduced. This results in the more efficient use of floor space leading to economies in capital cost and services.

Effect on Staff Meals

With the patients meals arriving on the wards at staggered times staff are able to leave at intervals for their own meals. This should create the desirable even flow of staff to the dining room, rather than their arriving in strict sittings. This again would facilitate batch cooking in the main kitchen.

Crockery Washing

A centralised meal service will naturally require all tableware to be in a central area clean and ready for the next meal soon after the previous service and this cannot easily be achieved if each ward undertakes its own crockery washing. A central crockery wash therefore should be sited close to the tray service assembly area and the correct size of automatic dishwashing machine installed. The area should be properly designed to receive patients dirty crockery, as well as those from the staff dining room. It should be arranged for the correct sequence of sorting, washing and the return of the clean items to the conveyor area and staff dining room. This arrangement has the side effect of almost eliminating the need for swill buckets at ward level, as nearly all waste food is returned to the central crockery wash. Furthermore, noise at ward level is also very much reduced owing to the removal of the non-nursing duties.

Effect on Staff Establishment

The catering department will require an increased establishment in comparison with a conventional bulk food trolley distribution system with nurses serving the food, additional staff being required not only to man the conveyor assembly but also for central crockery washing.

The actual number of staff will vary with the number of patients to be served and with the type of service adopted. A hospital of 300 - 500 beds may need as many as eight to fourteen (whole time equivalent) catering staff.

Beverages

In the USA beverages (called refreshments) are served from the main kitchen in the same way as meals. This rarely happens in England. It is usually preferred to make the beverages at ward level but this will depend on the design of the hospital. There is one new hospital having a kitchen on each floor for 300 beds, is close enough to the wards for all meals and beverages to be prepared in it. In others there may be a beverage point adjacent to the wards or even a floor pantry but nevertheless under the control of the catering officer.

The method chosen must suit the building and the internal organisation, and be of benefit to the patient. Central floor pantries serving more than one ward will obviate duplication of equipment, aid control of the costs of direct issues and be complementary to the central tray service.

Between meal beverages, early morning teas and late night drinks could be served in disposable cups. This will avoid the difficulties which arise from complete centralisation of washing up, which creates a need for larger stocks of these items. (Referred to in the book 'Crockery Washing'). Cups and saucers for beverages with all main meals can be placed on the patients tray at the conveyor belt in the central kitchen.

GANYMEDE SYSTEM
(King's Fund Report)

The Ganymede principle is the use of a heated pellet to keep the main dish hot but for soups and sweets insulated plastic or stainless steel bowls are used. The pellet is heated separately from the base into which it is dispensed. The plate rests on the edges of the base and thus the food is kept hot and palatable up to 10-15 minutes. After this period certain dishes such as fried foods and vitamin C foods show signs of deterioration similar to those in a bulk food service. The food nonetheless would still be reasonably hot for perhaps 40-45 minutes. However it is emphasised that it is essential to present the tray to the patients as soon as the trolley arrives at the ward if the main object of the tray service is not to be defeated. The alternative to having a loose pellet is to have it enclosed and sealed in the base the whole being heated as one unit. This is sometimes referred to as 'Heatstore.' These systems are marketed by Glynwed Foundries Ltd.

STELLEX SYSTEM
(King's Fund Report)

The Stellex central tray service differs from other centralised food service equipment in that food is kept hot in the meal transporting trolley which incorporates electrically heated metal pads. The pads (two for each tray) are located to centre under two purpose cut holes in the service trays. Plates of food are suspended in these holes so that every plate or dish is resting directly on a pad once the trays are placed in the trolley. This controlled heat source will maintain food at a satisfactory temperature during the trolley journey and meal service period. Should any delay occur at ward level the trolley can be reconnected at a plug point to re-charge the heat in the metal pads.

The Stellex system, in common with other centralised tray systems, needs a conveyor belt, mobile bain maries, plate and plate cover heaters, and tray dispensers for the continuous assembly of meals in the central kitchen area.

There are some essential differences in the organisation and catering administration of the Stellex system as compared with other systems. Because of the heat source is within the trolley, the patients menu choices must be analysed for hot and cold foods to predetermine how many of the pads need to be switched on for pre-heating.

The trolleys are designed with sufficient switches to isolate the pads in pairs, or singly, so that a choice menu can be accommodated. Soups, sauces and gravies are carried separately in containers in the trolley and these will be added at ward level. Therefore as there are less items to assemble at the conveyor belt less staff are required centrally but more time is occupied on the wards when meals are served.

Beverages

These are prepared at ward level as a general rule but there is room on the tray to add a cup, saucer and an individual tea/coffee pot and milk jug.

Crockery Washing

Centralised crockery washing is as essential to the Stellex system as any other centralised service both to obtain the maximum advantage from capital investment, and to effect a reduction of nursing time on non-nursing duties.

Flexibility

In contrast to some other systems the Stellex trolley can be used for very small numbers without a conveyor belt and associated equipment. Once the number of main meals to be served reaches 50 or so, then for the sake of speed and efficiency alone extra equipment to aid meal plating must be considered.

Marketed by C H Blackburn & Co. Ltd.

HELITHERM SYSTEM

The principle of the 'Helitherm' system is insulation. The tray, plates and bowls, have been designed as a combination of parts and when fitted together they maintain food (hot or cold) for a reasonable time at approximately the correct temperature by thermal insulation. Pre-heating of the porcelain meal plates in mobile dispensing trolleys is an essential part of the system. No other heat source is necessary either in the meal transport trolleys or on the food trays as the plate acts as a heat accumulator insulated by the meal tray. The tray is double cased to provide the insulation and is made from reinforced polyester resin which is non-warping. Indentations are pressed into the tray to accommodate a cup and beaker, cutlery, meal plates and bowls for soup and the sweet. The plates and bowls in the indentations are held in place during transporation and will not slide about while the meal is being eaten. A variety of dishes and plates have been designed to fit the tray and combinations of these dishes used in tests, have proved that English dietary can be attractively served.

The soup, sweet and cereal bowls, salad plate and some other flat ware have been made from macrolon. This is a material which is practically unbreakable and withstands constante machine washing without deterioration in appearance.

The 'Helitherm' tray, around which the system is built up, was originated in Sweden by Elektro Helios, and is marketed in Great Britain by Helimatic Ltd.

FINESSA

This is almost identical to the alternative Ganymede system (Heatstor). There is one less serving station than the usual Ganymede as pellet and base are dispensed together as one unit.

On the other hand there is a tendency for condensation to develop as it is not possible for air to circulate within the plate cover and under the dish easily.

In common with Heatstor it is possible to use Finessa under-dish heating equipment and plates for small numbers without the conveyor assembly.

The Finessa equipment is marketed by Grundy (Teddington) Ltd.

TWIN TRAY SERVICE

A twin tray trolley is, as the name implies, a trolley designed to carry two trays per person per main meal. One tray is held in a chilled compartment and the second is a heated compartment, the tray size being 12" x 16" minimum. A choice of menu is used as previously described except that the cold items for main meals are printed separately on perforated sections of the menu card. The sections are then detached for use in the kitchen and at ward level to identify the patients tray and meal selection. The remaining parts of the menu are used to indicate

the hot food chosen so that the correct trays can be presented to the patient. The twin tray trolley service requires a conveyor belt, mobile bain maries, plate lowerators and mobile food service equipment as do other systems. The conveyor belt may be a twin conveyor (hot and cold trays being prepared at the same time) or a single conveyor. An advantage of this sytem is that cold food can be loaded into the trolley in advance of the hot food thus speeding up the service of hot food. A full description of the operation, organisation and conveyor belt layout of this service is available as a separate report from the Catering Advisory Service.

CENTRAL PLATE SERVICE

Whereas central tray service systems are built up of specially designed and often exclusively manufacturered components, the Central Plate Service system is intentionally designed to use equipment, readily available from a range of manufacturers and the Ministry of Health Central Supplies List. If there is any special equipment at all, it is the meal transport trolley. Standard sized plates and trays, when used, lead to standard dimensions and such trolleys can be competitively produced.

Many hospitals using this system have a trolley consisting of heated upper sections which hold plated covered main meals and on the top of the trolley two or three bain marie containers for sauces and gravies. The lower half of the trolley is unheated and holds the plated cold food on patients meal trays. The shelves in the upper and lower sections are numbered to correspond with each other, thus a hot meal and tray can be married together at ward level. The bain marie containers may be dispensed with if desired, and the meals fully plated in the central kitchen area.

Some hospitals dispense with trays and place plated hot meals separated by plate rings in the top section and plated cold meals again using plate rings in the lower section. However when this policy is adopted there is usually a limitation on choice of dishes.

Plate covers are of particular importance to this kind of system and those which are designed to fit over the rim of the dinner plate are recommended. The covers will have to withstand constant handling and dishwashing and therefore the most suitable material is stainless steel. Insulated bowls of either plastic or stainless steel are generally used for soups, sweets and cereals and again more than one manufacturer can supply this equipment.

Conveyor belts can be obtained to any desired specification from a number of manufacturers independently of other equipment. Nevertheless it will probably be advantageous to obtain the conveyor and other mobile service equipment from one source. Whichever course is chosen in selecting the belt consideration should be given to the width, length, and material which is most suited for the particular operation.

PERIPHERAL FINISHING KITCHENS
(King's Fund Report)

This system is particularly suitable for hospitals designed in blocks in which there are four to six wards of 120 - 180 beds on a floor. It can operate with less beds per floor but it becomes more expensive in operation, and the capital cost per capita is increased considerably.

To operate finishing kitchens food is prepared in bulk in a central kitchen and such items as weill not depreciate by bulk cooking are cooked in the central kitchen. Other items such as fish, eggs, vegetables etc which are better cooked as near the time of consumption as possible are cooked on the periphery.

Operation

Menus, although prepared in advance, are sent to the wards on a daily basis. It is not necessary for the patient to select the meals today for tomorrow. The time for choosing can be deferred so that the patient can make his selection at 9 a m for the midday meal, 2 p m for supper, but the requirements for breakfast must be made by 4 p m the previous day.

Further it is not necessary for there to be one menu for each patient, four to six for each ward should be adequate providing the ward sister or someone at ward level makes a summary of patients' requirements. However, if the catering officer has to make a summary in his office there must be a menu for each patient. Alternatively the catering officer's clerk could go round the wards, but this would be a lengthy procedure for one person.

Items of food which could be cooked at a central point would be roast meat which cuts better when allowed to recover after half an hour, steamed puddings, and similar items. To operate this system a cook is delegated about half an hour before each service to finish and serve dishes. Meals for wards are staggered. For example on a four ward floor, the first ward would be served at 11.30, the second at 11.50, the third at 12.10 and the fourth at 12.30, or perhaps a little longer might be required between each ward serving. So at 11 a m the cook would collect the appropriate number of portions of each of the dishes selected and take them in a suitable trolley to the floor (peripheral) kitchen. If roast meat is to be served the roasted joints would be taken and sliced as required in the floor kitchen, the slices being placed directly on to the plate; fillets of fish would be eggwashed and breadcrumbed and taken from the refrigerator in the central kitchen and fried as required and plated directly from the frying pan in the peripheral kitchen; chips, eggs, bacon would be similarly treated. Thus, where desirable all foods would be served on the plates immediately after cooking, and a plated meal tray service provided. Although catering staff would serve the meals, the ward or floor sister would be present to supervise the patients being served.

Effect on Food

The appearance of the food should be as good as with the pellet system as it is virtually going straight from the frying pan on to the plate. The adjustment in size of portions could be made at the last moment. This of course would apply in most instances to the non-protein foods if a control of costs is to be maintained.

Effect on Staff Meals

Since meals for patients are staggered the effect on staff meals would be the same as for the pellet system.

Crockery Washing

In this system, a partial centralisation of patients crockery washing would be organised, i e the crockery from fhe four wards would be washed in the peripheral floor kitchen. A similar standard to the full central crockery washing arrangements should be achieved if the washing arrangements are properly designed. Noise of crockery washing is removed from the wards unless the kitchen is sited adjacent to one of the wards.

Effect on Staff Establishment

Whilst extra catering staff are required in the peripheral kitchen for serving food, taking tray trolleys to patients and washing crockery there should be a corresponding saving in ward staff. This can be achieved if all cleaning operations, message taking etc are centralised. There might on occasions be a slight increase in cooking staff, which it is considered well worth while because of the better standard of food presented to patients compared with a bulk trolley system.

OTHER SYSTEMS

Two other food services which are currently being considered by some hospitals are the frozen and chilled meal services. Whilst a brief outline of the systems is given in the following paragraphs any hospital contemplating production on these lines should read the DHSS document 'Pre-Cooked Frozen Foods' which gives guide lines on temperatures for the various operations in order to minimise the bacterial contamination.

Frozen Food

Frozen pre-cooked food may be used for the majority of all menu items in the meal distribution systems previously mentioned. Overheating and delay in the distribution of meals prepared from frozen foods causes a loss of nutrients and palatability comparable with conventional cooking and extended delivery periods (reference 'Food in Hospitals' Platt, Eddy, Pellett). Therefore the advantages of using frozen food can only be gained in total by designing and planning a food service which enables the catering department to deliver food in the shortest possible time to a patient after the reheat process.

Types of packed pre-cooked frozen food is generally available in aluminium foil containers measuring $9\frac{1}{2}$" x $9\frac{1}{2}$" x 2", which corresponds to a standard $\frac{1}{2}$ size bain marie container. The King's Fund project at Darenth Park Hospital uses 9" x 7" x $1\frac{1}{2}$" foil packs, which also corresponds to the $\frac{1}{3}$ size bain marie container. The use of these packs as 10 and 5 portion containers respectively will suit most hospital catering operations.

Single portion packs of entrees and fish dishes are also available and one day special diet dishes could be available in the single portion packs. For the time being the variety of food in single portions is limited and costly by comparison with bulk packs.

Frozen complete individual meals in aluminium trays have been available for some considerable time and are better known by the 'Top Tray' brand name. Two major experiments with this type of meal were run in hospitals some 5 or 6 years ago. The general result being good but difficulty was experienced with portion sizes and menu variation (reference report on the use of Frozen Foods - Manchester RHB).

Cook-Freeze

The production of pre-cooked frozen food by the hospital authority for use by a number of units is still at present being evaluated. An excellent quality of food can be obtained with direct control of the factory kitchen, but technical problems of quality and bacterial control require management trained in the science of food technology.

Storage and distribution of the frozen food produced must also be studied thoroughly if the full economic potential of the production and food service costs are to be obtained. Whilst the production unit may need to keep up to 1 month's stock in order to adopt production line methods, the hospital receiving the frozen meals may require 1 week's stock only.

Distribution of meals in the hospital may be by the peripheral kitchen method, i e each ward or group of wards reheating their food and plating the meals or it could be undertaken centrally by using a plating or central tray system providing the distances do not involve too long a period of time between plating and presenting to the patients. Maximum time lag not to exceed 10 minutes from plating the meal to presentation to the patient. DHSS say no ward should be further than 5 minutes from central kitchen.

Reheat equipment

Meals can be heated in quantity by hot air circulation ovens but it may be advantageous on occasions to combine these with steaming ovens, a deep fat fryer or a small capacity boiling pan. It depends on the size of unit involved and number of deep frozen dishes used.

The dishes used in the King's Fund experiment were balanced and all had the same reheat time. They were based on going straight from the low temperature store 21°C (-5°F) into the reheat units which in the case of the ovens used heated to approximately 204°C (400°F).

An alternative method for individual meals is to use a microwave oven. However to use this equipment it is desirable (almost essential) to thaw the food firstly and metal dishes should not be used. The recognised system for this is to estimate or be told the number of dishes required for the following day and the required amount is placed in a refrigerator the previous day. Thawing takes between 12-24 hours when the temperature in the centre should have risen to 2°C (37°F).

CHILLED FOOD SERVICE

Chilled pre-cooked food may be used in a centralised food production and meal distribution system. The final reheat process may be undertaken in peripheral kitchens or in individual wards. Thus considerable flexibility of planning is inherent when designing a new hospital, although this can apply to any hospital design which includes finishing kitchens for frozen or conventional food.

Meal Production

The production of pre-cooked chilled food has long been established as a method of service in Scandinavia and other parts of Europe. The operation of the various systems used is easier to control from all aspects in these countries because dietary habits require fewer hot meals than in British hospitals. When the use of chilled food is applied to our normal hospital dietary the control of meal production, plating, chilling and storage present both administrative and bacterial control problems which must be fully appreciated prior to planning and installation of the method. There are financial advantages to be gained from the system as kitchen labour need only be employed on a five day week normal day shift basis.

Reheat Methods

The two methods of reheating plated chilled food which have been found to give the best results because of rapid heating time are microwave ovens and the purpose designed quartz element oven. An example of the latter being the Regethermic oven manufactured in France (see Catering Advisory Service Regethermic Report). On the other hand if the food is packaged in sealed bags or containers it is possible to reheat by immersing the packeted food in boiling water.

PLANNING

It is easily seen that the different systems can affect the design of a new hospital. In the case of peripheral kitchens no ward kitchens are required although it might in certain circumstances be desirable to have a beverage point adjacent to each ward, depending on the distance of the wards from the kitchen. In the case of central tray or plated meal service, one main kitchen is required. Its dimensions on average need be only slightly larger than for other types of service. Since the meals for patients are staggered over a longer period smaller equipment is required but space for the service conveyor belt units, tray trolleys, and central crockery washing is needed.

Because nearly all types of centralised service and peripheral kitchens have been tested and tried out it should be possible to form a firm policy on catering for patients (and staff) at the outset of planning a new hospital, and also for a major upgrading of an existing building.

In the initial stages of planning, areas should be allowed for a large central kitchen and for peripheral or floor service kitchens. If a central crockery wash is not intended then the peripheral kitchen can at least be used for a partial central crockery wash.

After having agreed on the total area to be allowed and the type of building(s) to be erected the catering policy should be decided. If the hospital is to be a multi-storey building and to have a Tray Service from the central kitchen it would be advantageous to work the system in conjunction with a trayveyor lift or automatic transport system. If for some reason the catering policy is not decided at this stage the actual area allotted for the catering department should be on the ground floor for ease of access to the circulation routes of the building and ingress of supplies.

The area allowed should be sufficient to deal with a plate service from the kitchen and a central crockery wash. If this area is provided it will cover all other systems, including a pre-cooked or frozen meals service. With the latter the storage areas will have to be considerably enlarged and refrigeration increased; but preparation areas will virtually disappear; cooking equipment should include types of equipment (suitable for heating frozen foods) but the total area would remain almost the same. The catering department should include goods reception, storage of food, preparation, cooking and service areas.

It may well be that three or four years after deciding to build a hospital a detailed plan has to be prepared, for although it should be possible to change from one system to another even after the hospital has been built it would of course be very costly. Therefore, it is at this stage (detailed planning) that the final decision on the policy must be taken. It is not however absolutely essential to make a final decision on the make of central tray equipment until the detailed planning stage.

As mentioned in the previous paragraphs if sufficient areas have been allocated for a finishing kitchen on the peripheray and a catering unit on the ground floor, any of the policies could be put into operation.

G J Stormont

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KING EDWARD'S HOSPITAL FUND FOR LONDON

CATERING ADVISORY SERVICE

Appendix I

Ward.....Name.....

Date.....Diet.....

BREAKFAST

Porridge+
1. Cornflakes
F1 Stewed Prunes +

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81 Grilled Bacon & Tomato

92 Boiled Egg +
52 Poached Finnan Haddock +

Tea
Coffee
Bread
Butter
Marmalade

Ward.....Name.....

Date.....Diet.....

DINNER

1. Cream of Lentil Soup
21. Consomme

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1. Roast Beef & Yorkshire Pudding
2. Boiled Chicken & Cream Sauce +
31. Cheese Pudding +
41. Cold Roast Mutton

A. Potatoes - Creamed +
B. " - Fried
C. " - in jackets

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a. Garden Peas +
b. Green Salad

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1. Steamed Jam Sponge & Custard +
11. Baked Rice & Plums +
111. Fruit Jelly
XX1. Cheddar Cheese & Biscuits

Ward.....Name.....

Date.....Diet.....

SUPPER

2. Cream of Tomato Soup +
21. Consomme

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53. Baked Fillet of Cod with Lemon
82. Grilled Sausages
21. Blanquette of Veal +
42. Cold Roast Beef

A. Potatoes - creamed +
D. " - saute

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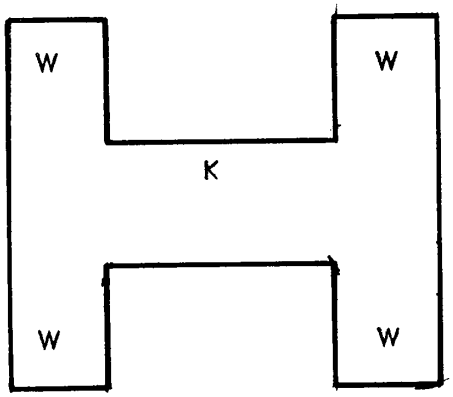
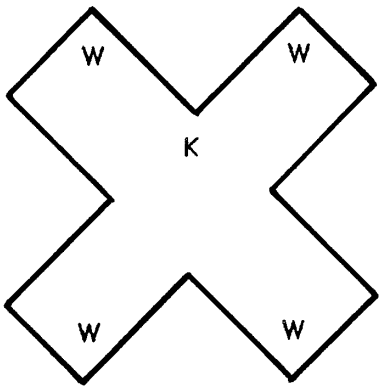
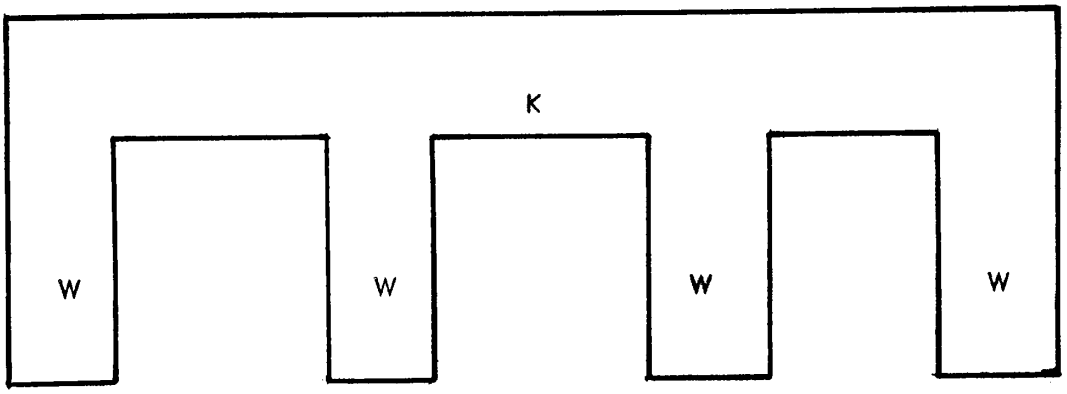
d. Beans in Tomato
e. Carrots Vichy +

IV. Blackberry & Apple Pie & custard.
V. Cream Caramel +
XX11. Cheshire Cheese & Biscuits

N.B. 1. Dishes suitable for light Diets marked +
2. For Soft Diets, please mark 'S' by diet required







WARDS SHOWN ..... W

DIAGRAMMATIC POSITION FOR KITCHENS SHOWN..... K