Flight- Catering

Introduction

The flight catering industry is a very large, global activity. The total market size is estimated to be around 12 billion euros. More than 1 billion passengers are served each year. It is probably one of the most complex operational systems in the world. For instance, a large-scale flight catering production unit may employ over 800 staff to produce as many as 25,000 meals per day during peak periods. Large international airlines may have more than 1,000 takeoffs and landings every day. A single, long-haul Boeing 747 has over 40,000 items loaded on to it before it flies. All together these items weigh 6 metric tonnes and occupy a space of 60 cubic metres. These items range from meals to toilet bags, from duty-free goods to first aid boxes, from newspapers to headsets. Food items must be fresh and items for personal passenger use must be clean and serviceable.

These facts and others like them make flight catering unlike any other sector of the catering industry. While the way food is served on trays to airline passengers bears some resemblance to service styles in restaurants or cafeterias, the way food is prepared and cooked is increasingly resembling a food manufacturing plant. Certainly the hot kitchen in a typical production kitchen is often no more than 10% of the total floor area. The rest of the space is used for bonded stores, tray and trolley assembly, and flight wash-up. And almost certainly there are far more loaders and drivers employed than chefs. The way food and equipment is stored resembles a freight warehouse, and the way meals and equipment are transported and supplied has a close affinity to military-style logistics and distribution systems.

When the very large numbers and variety of items which must be loaded for passenger service during a flight are considered, together with the need for them to be loaded at widespread locations, the logistics complexity is obvious. It is therefore not surprising that the President of KLM Catering once said that “Flight catering is 70 per cent logistics and 30 per cent cooking.”

Role of Food Onboard

How important are food and onboard service to the airlines? Some airlines use food as a marketing tool. A number of airlines advertise their product by making food the focal point. But food as a marketing tool has only a limited impact. Surveys over a number of years suggest that passengers appear most concerned about safety, on-time performance, scheduling/ticketing issues, the aircraft's physical surroundings such as seat and leg comfort, and gate check-in and boarding. This means that while food is important, it is unlikely to be the deciding factor in a passenger's airline choice. This is most clearly seen in the USA where deregulation has had a great effect upon competition and fare wars are common. This has led to most US airlines implementing a no-frills policy where no meals are served on board flights within the USA. This same trend is evident in Europe, with carriers such as Ryanair and EasyJet offering low cost, no frills flights between European destinations.
Consumer (and media) perceptions of meal quality in airlines is low. This may be due to a number of factors which affect passengers’ appetite and behaviour whilst flying. Sensory abilities such as smell, sight, and taste are affected by the relatively low humidity and air pressure experienced at altitude. This affects taste buds (which may function as much as 30 percent below par) and mucous membranes in the nose (which blunts the sense of smell). Airline food is often more highly seasoned for these reasons. Likewise, at such a high altitude not all wines retain their subtle aroma and bouquet and this has to be taken into account when wine lists are chosen by the airlines and caterers. Also, as passenger movement and exercise is limited at such high altitude, the meals provided need to be easily digestible. Moreover, the effects of alcohol are more quickly observed in a pressurised cabin and on dehydrated passengers.

Research at the University of Surrey suggests that while food and drink in flight may not affect pre-purchase decisions, it emerges as a highly significant post-purchase factor. The onboard service and meal is the most remembered aspect of people’s travel experience, so the food service offered to passengers is still an important part of the overall service experience but as the factors listed above begin to suggest, providing a product that will satisfy the customer is about much more than simply providing a ready meal. The passenger receives a final product that can consists not only of well-seasoned food but one that is made up of many different products procured from many different places and through many different processes.

**Major Stakeholders**

The in-flight catering industry consists of five major players: the airlines, or their various representatives; the providers, in this case specialised flight caterers; the suppliers, either to the providers or direct to the airlines; those using the airline’s services, that is the fare-paying passengers and distributors (Fig. 1.4-1).

![Figure 1.4-1 Major Stakeholders in Flight Catering](image_url)
a) Role of the passenger

A feature of the airline industry is the huge diversity of customers. Prior to the 1960s, air travel was exclusive – only the very rich or government employees would fly long haul. The development of jet aircraft and charter airlines lead to mass air travel. Subsequently in the 1990s, the business model was redesigned by the operators of so called low cost or budget airlines.

b) Role of airlines

Airlines are responsible for the design of onboard service. This is affected by the time of flight, length of flight, point of embarkation and disembarkation, nationality or ethnicity of passengers, seat class (economy, business or first), budget allowed by the airline, price of food, seasonality of food, cost of labour to make a food item, time required to serve the food, number of flight attendants available to serve food, time needed to consume food, ability of meal to be consumed in a small place on a plane, the time and effort needed to clear an item, the needs and desires of the passengers, odours that may penetrate the cabin, the ability of meal to be rethermalised and the ability of the meal to withstand low humidity and pressures. Given this long list of variables it is not surprising that the nature of onboard service varies widely from flight to flight and airline to airline.

c) Role of caterers

Caterers have two main roles: to prepare items not bought in directly from suppliers to a state ready for loading on board and to assemble trays and trolleys. Flight kitchens are always located near to major airports and are usually used to 'manufacture' consumable food items. There are two main reasons why menu items may be made outside of airport-based flight kitchens: the cost of space and the cost of labour. Airport space is at a premium so often it is not feasible for a flight kitchen to produce all of the meals needed for every seat class. For instance, some flight kitchens or caterers may make their first-class, and in some cases business-class, meals from scratch at the flight kitchen and outsource all other meal production.

The caterer is often in an unusual and sometimes difficult, position. Although they are a customer of the supplier, the products used may not be of their choosing but may have been determined by the airline. When the products used are those purchased directly by the airline, caterers only charge for a handling and storage fee of the product but not the cost of the product. For instance, all liquor products for tax reasons must be purchased by the airlines, either through a prepaid arrangement with the distributor or through an arrangement whereby the charges are directly invoiced to the airline. However, the caterer is often responsible for keeping and accounting for any such products and these products are usually delivered directly to the caterer’s bonded store. The challenge for caterers is that the products are the property of the individual airlines served by the caterer. Products belonging to one airline cannot be used for another, even if the two airlines use identical products.

d) Role of suppliers

Suppliers may supply the inflight industry in two main ways. First, based on the planned menus, the supplier receives direct orders from the airlines, although they deliver their goods to flight kitchens operated by the contracted caterers. Airlines buy direct from suppliers because they want to have continuity of supply in all their stations, because they negotiate a discount, or because they want to maintain a particular brand image. Second, the supplier may supply the caterer directly, with products that meet the contract specification.
Likewise suppliers have two approaches to manufacturing their products. Some supply airlines (or their caterers) with their standard products, whereas others make and supply specialist products specifically designed for the in-flight kitchen. In the first instance, the manufacture of these products is likely to take place in a factory or plant producing many other products. The products for in-flight service may be slightly modified for that market. For instance, spirits manufacturers need to bottle their spirits in miniatures rather than 40 oz bottles. In the second case, the manufacturer concentrates on simply producing a cycle of food items, often providing their sole business and hence they can produce large amounts of these items to be sold to the flight kitchen, as a method of outsourcing. These food manufacturers can make these items in volume at a lower cost than the flight kitchen can. The cost of labour to mass produce meals is obviously cheaper a good distance away from large cities where airports must exist. Historically it was mainly frozen meals, or ‘pop-outs’ as they are called in the USA, that were outsourced in this way. Today all kinds of specialist food items may be outsourced, such as canapes, ethnic meals, vegetarian items, patisserie, and so on.

e) Role of distributors
Distributors are typically global logistics companies, specialising in moving goods around the world, often in containers. They provide two main services for airlines or caterers. They can distribute materials and meals from vendor/suppliers to both the caterers and the airlines and they can track the numbers, volumes, and brands of the products they distribute. Using a specialised distributor or logistics company allows the airline and caterer to better manage the flow of materials from aircraft to flight kitchen and back again. This applies to both short-term food items and to longer term recyclable items, including equipment.

The Flight Catering System

The flight catering system is illustrated in Figure 2. This model represents only an outline of the process flow in flight catering, since such operations have a number of alternative configurations. Flight catering starts with an understanding of the number of passengers and their needs; such information is available from both market research and actual passenger behaviour. On the basis of this, airlines, sometimes in consultation with caterers and suppliers, develop their product and service specifications. Such specifications determine exactly what food, drink and equipment items are to be carried on each route for each class of passenger. In response to forecasts of passenger numbers on any given flight, the production unit follows a series of complex steps to produce trayed meals and non-food items ready for transportation to the aircraft.

Transportation is usually carried out by using specialist high-loader trucks that enable trolleys to be rolled on and off aircraft. Once loaded, trolleys and other items need to be stowed on board to ensure the microbial safety of edible items and the security and safety of the crew, passengers and aircraft. At the designated time during the flight, the cabin crew then carry out the service of meals, snacks and other items. Upon arrival at its destination, each aircraft is then stripped of all the equipment and trolleys, which are returned to the production units for cleaning and re-use. In achieving this, it is necessary to understand the impact of flying on the physiology of the passenger, to manage a complex supply chain, ensure the safety and quality of the product, utilise increasingly sophisticated information and communication technologies, and engage in on-going research and development.
Traditionally there have been three basic variations in this system. In North America, the basic model was for airlines to take responsibility for determining strategy, designing or selecting offers, items and components, galley planning and sourcing. The airlines then contracted out to caterers - storage, inventory control, preparation, assembly, loading/unloading, recycling and waste disposal. Caterers then purchased from suppliers the raw materials, components and items they needed in order to meet their contractual obligations with the airline.

However this model applies only to the supply of fresh items i.e. meals. There was a different model for the supply of retail items, such as alcoholic beverages, soft drinks and duty free good. In this case, airlines tended to negotiate directly with suppliers; whilst the elements of preparation, packaging and tray assembly were unnecessary as these items came in ready for sale. This retail flight catering supply chain is used not only in North America but also in Europe.

Figure 1.4-2  The Flight Catering System
However, the fresh supply chain in Europe was configured differently to North America, as airlines did not have caterers to whom they could outsource. Hence, the third variation was backwardly integrated airlines ie they owned and operated their own flight kitchens. Over time, European airlines have decided to dispose of their kitchens, but two – Lufthansa and Swissair – developed their catering divisions so that they grew into LSG Skychef and Gate Gourmet, now the two largest flight caterers in the world.

Although there have been many innovations in the supply chain from the 1990s onwards, these three basic models continue to the present day. The larger and growing airlines in the Middle East and Asia have tended to adopt the European model; whereas the European airlines have tended to divest themselves of their flight catering operations and have adopted the North American model. Both in-house and outsourced catering will continue to be adopted in the future, although increasingly this is only likely to be applied to first and business class offers.

This analysis also explains how it is possible for airlines to switch away from complimentary meal service to so-called ‘buy on board’. In essence, buy on board is based on the idea that the food items become a retail product. Hence, the retail supply chain can be adopted for this purpose. Low cost airlines, as part of their business model, adopted the retail approach to the flight catering supply chain from the very beginning.

**Reconfiguring the Flight Catering Supply Chain**

In addition to the three ‘traditional’ models of the flight catering supply chain (described in section 4), four new models have been developed in the late 1990s and early 2000s. One of the first examples of forward integration was in the 1990s when Delta Daily Food, a supplier, forwardly integrated and took over elements of the supply chain normally carried out by the caterer. This was made possible by the proximity of their food factory to Schipol airport in Amsterdam, so that it was possible for them to add packaging, tray and trolley assembly to their existing food manufacturing facility. However, this model is relatively unusual, as it does depend on the supplier being located relatively close to airports.

Another way for suppliers to forwardly integrate is to eliminate some elements of the supply chain so that they can supply airports from wherever their factories are located. This typically involves using disposable packaging that eliminates the need for tray assembly and even trolley assembly. For instance, Supplair have developed a range of retail style food products and disposable packaging that can be delivered direct to flight kitchens, so that the role of the caterer is reduced to tray and trolley assembly and loading.

A slightly different example of this approach is the Nestle Sky Tray. This concept consists of the ‘Hot Pocket’ brand, a hand held hot snack, which is packaged on a thermally resistance service tray. The trays are packaged in boxes that are the same size as aircraft ovens. Hence boxes can be transported by Nestle to flight kitchens and then loaded directly onto aircraft without any assembly by the caterer. On the aircraft, the trays are unloaded from their container, placed in the oven, reheated and then used to serve the passengers directly from the oven. Not only does the concept eliminate elements of the caterer’s part of the supply chain, it also simplifies the airlines design of meals, requiring them only to select the product they want.
As well suppliers forwardly integrating, caterers are also able to do this. This means that airlines focus solely on setting the overall service strategy and outsource the specific design of items, components, galley planning and sourcing to the caterer. Airlines have been encouraged to do this by the development of internet based systems such as e-gate matrix and e-LSG, which can allow both the caterer and the airline to see what is happening at each stage of the supply chain. Alpha Flight Catering have set up a division called In-Flight Service Management (IFSM) which also takes over many of the activities that the airlines in-flight department may previously have carried out. They argue that IFSM, because it manages many airlines, can afford to employ experts in a wide range of areas that individual, smaller, airlines would not be able to employ; and that such expertise leads to lower cost operations.

Finally, a new stakeholder has entered the supply chain in the form of third party logistics providers, such as Kuehne and Nagel. These logistics companies tend to have a global warehousing and transportation capability that enables them to achieve significant economies of scale. This enables them to take over those elements of the supply chain in relation to storage and transportation at a lower cost than can be achieved by any one of the existing stakeholders. In particular, logistics have been particularly successful with respect to the traditional retail supply chain.

In fact, these four are simply examples of how different elements of the supply chain are being bundled together in new and original ways. In line with many other industries, it is becoming clear that the concept of the supply chain is somewhat old-fashioned. It is more appropriate to think in terms of a supply network, with all the increased sophistication that a network configuration would suggest. Hence it is possible for a single airline to have adopted a number of different configurations depending on where it flies to, its type of route and so forth.

In addition, this analysis shows that only a few elements of the supply network are always undertaken by the same stakeholder. Airlines are always responsible for their strategy, but may outsource every other element. Likewise caterers are always responsible for loading and unloading aircraft, recycling and waste disposal because no other stakeholder has the infrastructure, i.e. the high-loader fleet necessary to perform these tasks. Outside of these areas, it increasingly becoming blurred as to whether or not it is the caterers, the suppliers or third party distributors engaged in the different elements of the supply network.

Increasingly, supply chain management is linked closely to inventory management, as operations try to reduce their stock-holdings and rely on just-in-time (JIT) delivery and production. This has cash flow benefits for the business, as well as potentially reducing the capital investment costs in storage facilities. But even with JIT, flight caterers are still required to ensure safe and secure storage of all types of materials in their production units.

**Flight Catering Logistics**

Logistics is concerned with adding value and reducing waste across the whole flight catering system. It is particularly concerned with non-consumable or non-disposable stock items (crockery, glassware, trays, etc.), although increasingly it is addressing other types of inventory too (particularly alcoholic beverages and duty free items). In order to use these stocks effectively and efficiently, logistics is concerned with:

- material demand forecasting
- equipment sector (or shelf) life

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- material demand forecasting
- equipment sector (or shelf) life
The principal objectives of a logistics system are based around getting the right products/materials to the right place(s) at the right time and at least cost. The logistics issues of flight catering are affected by a number of important features of the airline industry, the most important being the basic features of the business, the specifics of route scheduling, the impact of actual passenger loadings, and the 'product' mix.

The basic features of the industry are that it has global dimensions, is highly competitive and profitability depends largely on maximising revenue in the face of variable demand. The airline business is increasingly competitive and most airlines in considering their competitive edge take account of the quality of the 'service package' offered to customers. For instance, there are strong pressures in some cases to use quality non-disposable items rather than cheaper disposables, such as china crockery, rather than disposable equivalents. The reinforcement of brand image also causes most to require that several items bear the company livery and logo. This has strong implications for the logistics problem since it could prevent local supply of these items.

Demand can be highly variable both in the shorter cycles (across a week) and longer (across a year). Profitability is very dependent on maximising revenue for which the technique of yield management was devised. The basic aim of this is to maximise passenger loading while as far as possible ensuring that the average fare paid by customers is also maximised. This may result in a wide variation in the passenger mix. At 'peak times' when seat sales are relatively easy, there may be a high proportion of first-class passengers, while at off-peak times there is a higher proportion of sales in the economy class. Thus, the logistics system must be capable of adapting to variations not only in passenger numbers but also in the mix of passenger service requirements. For instance, outbound flights from Paris to European destinations will carry a high proportion of business people, especially in the morning, whereas the return flights will have a higher proportion of leisure travellers. Likewise, over the long cycle, flights into Switzerland carry a very different mix of business and leisure travellers in the ski season than at other times of the year.

In addition, the drive to maximise seat occupancies sometimes leads to flights having intermediate stops so that tickets may be sold not only for an entire flight but also for parts of it; that is, for one leg of the journey. This may present the additional logistics complication of restocking aircraft at intermediate stops. For instance, although it is technically possible for an aircraft to fly non-stop from Europe to the Far East, many flights have a stop-over in the Middle East or India in order to improve seat occupancy levels.

Long-haul flights present special problems in terms of co-ordinating the logistics function. This is particularly the case where airlines have full traffic rights and seek to maximise revenues from each sector of a multiple leg flight. For catering uplifts this
means that logistical arrangements can be quite varied. For example, long-haul economy meals, as high volume and relatively standardised products, may be supplied from the place of origin and an intermediate port of call. However, on the same flight, first- or business-class meals offering extensive customer choice and menu flexibility, may be catered throughout from the place of origin. Maintenance of a consistently high standard of service may leave this as the only viable option. Additionally, it may prove advantageous to uplift other items such as liquor elsewhere on the journey.

Passenger factors are major drivers which test the responsiveness of the logistics system on a day-to-day basis. Passenger numbers affect the size of uplifts for meal trays (but not for bars, which are normally stocked to par stock levels). In order that balance is maintained within the system, equipment levels will have to remain relatively constant. For short-haul flights, which fly to a destination and return directly to point of origin, there should be no major problem. If the aircraft flies out with a full set of equipment, it should return with a full set. But even on short haul, in aircraft with a flexible cabin that allows the size of business class relative to economy to increase or decrease, some equipment imbalance may occur. On long-haul flights, however, especially those with intermediate stop-overs and more than meal service, equipment taken off the aircraft at one point may not automatically be reloaded at the same point. To overcome this problem, airlines have adopted ‘dead heading’. This involves loading aircraft with equipment items sufficient for the maximum number of passengers irrespective of meals required, thereby ensuring that equipment exchanges at intermediate or final destinations can take place without excess stocks developing in some parts of the system and shortages occurring elsewhere. Thus it is a logistics requirement that equipment exchanges take place satisfactorily under conditions where, for example, outward flights may be carrying low occupancy but return legs the opposite. Unless massive stocks were to be held at each catering supply point it is easy to imagine a situation where differences in passenger numbers could lead to much of an airline's equipment ending up in one place. Even for charter business where passenger loadings are less volatile and back catering more common, this type of arrangement tends to hold for equipment items.

Many airlines operate aircraft dedicated to particular routes and with fleets conforming to identical configurations. Therefore, any change of aircraft for whatever reason, such as maintenance overhauls or traffic delays, should have little impact upon the logistics function.

**Flight Catering Information Systems**

The interface and passage of information between those who provide goods or services and those who receive or use them are important in any business operation. Flight catering is no exception, but the nature and immediacy of the catering product require that the information be both accurate and timely if it is to be of any value in the decision-making process and the continued success of the operation. Information needs to be passed between three major players: the airlines, or their various representatives; flight providers, in this case caterers and other suppliers; and those using the airline's services, that is the fare-paying passengers.

However, the passage and smooth flow of information is not easy and in the airline industry it is compounded not only by the immediacy of the products and services involved but also by the fragmentation and international nature of the business. In addition, it is difficult at times to know who the customer really is; who therefore influences and affects the information being received and processed and, in
consequence, the relative importance of these influences in the decision-making process.

The provision of integrated information systems for all aspects of flight catering are still at a relatively early stage of development. This is because it is only recently that the I.T. industry itself, and software developers, have had common platforms on which to develop their systems. The most obvious common platform that most people are familiar with is the internet or world-wide-web. But other developments, such as Windows, have also helped to facilitate the integration of systems that hitherto had been almost impossible to link together.

In the flight catering industry, the scale and scope of such systems often reflects the particular orientation of the IT provider or software developer. Some systems are based on airline reservation systems and have integrated backwards along the supply chain to add on related software programmes. Other systems are based on software originally developed by caterers for managing the production processes in flight kitchens. In another case, the original software was developed to facilitate galley planning, from which further programmes were developed to address issues of forecasting, scheduling, loading and equipment balancing.

Due to the variety of sources of IT solutions, there is no one agreed information systems ‘map’ or schema which shows all the information requirements for flight catering. Indeed there may never be a single such map, as different airlines and/or caterers may have very different needs. Information, and the systems that communicate and analyse this, costs money. There is no point in having a more sophisticated system than the business requires. Hence no frills or budget airlines are almost certainly going to have a system that looks and behaves in different ways to a system that supports a full-service carrier. Furthermore, the system in use may reflect the age of the firm, or at least the last time a major investment was made in I.T. systems. Some airlines may have so-called ‘legacy’ systems, that is to say hardware and software that they are left with, and which are far from state-of-the-art. Nonetheless Table 1 attempts to list all the different types of information that might be included in an integrated system.

**Airline – Caterer Contracts**

The relationship between an airline and caterer is based on service delivery. The airline requires its catering supplier to deliver on certain key variables, such as:

- Consistency of food product
- Accuracy of uplift
- On time delivery
- Value for money
- Service relationships
- Health, hygiene and safety
- Innovation
- Overall operational performance
Table 1: Information needs for flight catering

<table>
<thead>
<tr>
<th>Type of information</th>
<th>Principal source of information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes flown and flight schedule</td>
<td>Airline timetable</td>
</tr>
<tr>
<td>Aircraft type</td>
<td></td>
</tr>
<tr>
<td>Flight number</td>
<td>Airline timetable</td>
</tr>
<tr>
<td>Service provision for each route</td>
<td></td>
</tr>
<tr>
<td>Menus and meal specification for each class</td>
<td>Specification manuals</td>
</tr>
<tr>
<td>Dish and recipe specifications</td>
<td>Specification manuals</td>
</tr>
<tr>
<td>Raw material requirements</td>
<td>Specification manuals</td>
</tr>
<tr>
<td>Menu rotation sequence</td>
<td>Airline policy and/or contract with caterer</td>
</tr>
<tr>
<td>Equipment and tray lay up specifications</td>
<td>Specification manuals</td>
</tr>
<tr>
<td>Equipment inventories</td>
<td>Stock-taking and inventory records</td>
</tr>
<tr>
<td>Passenger numbers (pax.)</td>
<td>Reservations systems</td>
</tr>
<tr>
<td>Classes of passenger</td>
<td>Reservations system</td>
</tr>
<tr>
<td>Hot meal production</td>
<td>Pax x class x route</td>
</tr>
<tr>
<td>Tray assembly data per flight</td>
<td>Pax x class x route</td>
</tr>
<tr>
<td>Trolley assembly per flight</td>
<td>Pax x class x route x aircraft type</td>
</tr>
<tr>
<td>Equipment balancing</td>
<td></td>
</tr>
<tr>
<td>Galley plans</td>
<td>Stowage plans</td>
</tr>
<tr>
<td>Aircraft loading</td>
<td>Loading sheet</td>
</tr>
<tr>
<td>Actual operating costs</td>
<td></td>
</tr>
<tr>
<td>Budgets</td>
<td></td>
</tr>
<tr>
<td>Invoice reconciliation</td>
<td></td>
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</tbody>
</table>


However in the complex business world of today, all of these things cannot be simply agreed on the basis of a handshake. So in the majority of cases, airlines and caterers enter into a legal relationship based on a contract between them.

In most cases, caterers are invited to tender for an airline contract. Such a contract may apply to just one station, such as Schipol, or apply to all the destinations an airline flies to in a region of the world, such as the Middle East. Rarely does it apply to all the destinations an airline flies to, unless this airline is relatively small. In some cases, caterers do not wait to be invited to tender, they make what is termed a ‘pre-emptive bid’. They do this when they know a contract is likely to be coming to an end and they believe that this airline’s business would be a good ‘fit’ with the other contracts they have.

a) Contract Specifications

Contracts between airlines and caterers may be very long and detailed documents, but they will conform to a fairly standard structure, comprising the following elements.

Terms of agreement – this specifies the length of time the contract will be in force. Typically in this industry contracts are for one to three years. The trend is for them to be longer rather than shorter.

Definition of services – each and every element of service being provided will be defined in precise terms. For instance, terms such as ‘uplift’, ‘menu specification’ and so on will have definitions if referred to in the contract.

Charges and payments – the prices to be paid for service rendered will be identified along with any relevant terms and conditions applying to such payments in relation to timing of payment, form of payment, and so on.
Title and risk – as, in most cases, the caterer will be handling equipment belonging to the airline, it is necessary to identify who owns what (title) and who has liability for any loss (risk). Typically the airline has the title, but the caterer bears the risk.

Indemnity and liability – these clauses of the contract limit the ability of either party to the contract to sue the other party.

Warranties – in some cases one of the parties to the contract, usually the caterer, will provide a guarantee, in the form of a warranty, to the other party.

Confidentiality – most contracts contain a clause that ensure that both parties keep the terms and conditions of their contract confidential.

Termination – the contract will specify under what conditions either party can end the contract and how much notice must be given if doing so.

Force majeure – this legal term applies to allowing a suspension of the terms of the contract due to so-called ‘acts of God’, that is to say if events outside the control of one of the parties prevents the contract from being honoured.

Business continuity – this clause will identify what happens to the contract if one of the parties is taken over by a third party or goes out of business due to insolvency or bankruptcy.

Law and jurisdiction – this clause will specify in which country the two parties agree the contract is signed, so that the laws of contract of this country apply to any legal dispute between the two sides.

Waiver – this clause ensures that neither party is able to change any part of the contract without the agreement of the other party.

Invalidity – this clause ensures that in the event that one clause of the contract is shown to be invalid (ie not of legal status), this does not make the whole contract invalid.

b) Service Level Agreements

In addition to this legal contract, attached to it or as part of the overall agreement between the airline and caterer, there may be additional documentation such as a service level agreement, a price list, and standards of performance criteria. A typical service level agreement would have detailed specifications of how things were to be done, relating to such things as hygiene, punctuality, product specifications, security, equipment control and waste management. It may refer not simply to delivering trolleys to aircraft, but to other operational aspects. For instance, some airlines require their caterers to make quarterly presentations on new menu ideas as part of their agreement. Likewise there will be specific performance targets that caterers will be expected to meet. Such targets might include:

- Number of aircraft delays allowed per month (typically no more than 1%)
- Number of adverse cabin crew reports permitted
- Number of catering related passenger letters
- Allowable % of incorrect weights of product
- Number of occasions of incorrect invoicing
- Hygiene audit scores

If performance falls outside the allowed tolerances the penalties to pay will be specified. Likewise if performance is particularly good, there may incentives paid.

c) Pricing of inflight meals

The range of pricing methods is very wide, from a simple, ‘multiply by a factor’ to a sophisticated multi-disciplined approach. Some methods are straightforward in that they require the minimum of data collection and manipulation and are therefore attractive for that reason. There is little evidence to suggest that more sophisticated
methods are more successful than simple straightforward ones, but they must be based on standard recipes.

Price is a determinant of demand. Pricing is never a simple matter of 'mark up over cost'. When and how to raise prices is just as critical as the amount of the increase itself. The market for the flight product appears to be becoming ever-more price sensitive and more value conscious, indicating that those flight caterers who wish to survive and increase their profitability in a much more competitive environment will need to concentrate even more on costing and pricing. Successful pricing methods are able to contribute to establishing a 'competitive edge' over very aggressive and increasingly margin-conscious rivals.

In many ground-based catering operations, price is based on raw material cost, with sufficient margin to cover labour and overhead costs. In flight catering, price is often established on the basis of separately calculating each of these elements of cost. This is because the labour cost for a meal item may vary widely according to whether a product is simply handled or significantly processed within the flight production unit. For instance, hot entrees such as casseroles or stews may be outsourced to a food manufacturer (handling costs only) or be prepared from entirely fresh foodstuffs in the flight kitchen (production, processing and handling costs). It is therefore common for separate prices to be established for different aspects of provision, such as stock-handling and warehousing, food production, tray lay-up, transportation, and ware washing.

Future Trends

As airlines continue to demand higher quality inflight food offerings at lower prices, inflight caterers and suppliers are continually exploring new, innovative and diverse ways of remaining competitive.

a) More diversity of onboard offer

Airlines throughout the world are experimenting with different ways of serving meals to passengers. These options include buy-on-board food products, buy-at-the-gate options, giveaway-at-the-gate and offering a picnic bag rather than tray-set.

b) More blurring of stakeholders in the supply chain

Suppliers have begun to eliminate some elements of the supply chain so that they can supply airlines from wherever their factories are located. This is often in direct competition with airline caterers and typically involves using disposable packaging that eliminates the need for tray assembly and even trolley assembly. Section 5 highlighted some of these examples. For instance, Supplair's products can be delivered direct to flight kitchens, reducing the role of the caterer to transportation and loading. Nestle Sky Tray's 'Hot Pocket' brand, are delivered straight to flight kitchens and then loaded directly onto aircraft without any assembly by the caterer. On the aircraft, the trays can be also be used to serve the passengers directly again reducing the role of the traditional flight caterer. Finally with the use of logistics firms such as Kuehne and Nagel whose global warehousing and transportation capability offer significant economies of scale, elements of the supply chain can become totally removed from traditional stakeholders.
c) Process Improvement in Flight Kitchens

With the external pressures from customers and competitors, it is not surprising that all flight catering firms are seeking to reduce their costs by operating more efficiently. To do this they have turned to the lessons learned in manufacturing and assembly plants – most especially the concepts of lean or agile manufacturing and just-in-time production. The approach being adopted varies from firm to firm, and from plant to plant, but some clear trends are evident. These are:

- **Average cycle time (ie total processing time) in the industry used to be about 24 hours – some plants have reduced this to 8 hours**
- **Reducing cycle time has been achieved by taking ‘waste’ out of the system – wasted time, wasted movement, too much stock, unnecessary transportation, and etc.**
- **An industry norm was that each aircraft need 3.5 sets of equipment (one set on the plane, one being cleaned at the point of departure, one ready for loading at the point of arrival, and a half set to cover losses and breakages). By reducing cycle time, global caterers have significantly reduced the total amount of equipment in the system.**
- **Less equipment frees up space in plants to enable revision to process layouts, simplify inventory control, and generally use space more efficiently.**
- **Inventory management is switching to the kanban system, ie standardised bins of each inventory item.**
- **Tray assembly is switching from conveyor belts to work stations based on kanbans.**
- **Non-standard catering, such as for special meals, is being outsourced to specialist suppliers.**

**Conclusion**

In summary, there are five major types of players in the airline catering business. These are the carriers (Airlines), the providers (Caterers), the suppliers (manufacturers), the distributors and the passengers. Each airline carrier decides what kind and how much food service they require and which flights need which types of service. Obviously food service can be used as a marketing tool; some airlines for instance, do not give as much service if they have no competition or if the flight is exceptionally short such as under 1 hour. Some passengers may be willing to forgo food on ‘no frills’ or ‘peanuts’ flights if fare prices are slashed. All of this is for the airline company to decide.

The carrier must also decide whether to operate its own catering operation or which caterer to contract with. This decision is based upon location, availability, reliability, long time relationships, cost and convenience. Costs must be carefully negotiated by both the caterer and the carrier. The carrier cannot afford to pay too much as each fraction of a penny may add up to thousands of pounds or dollars, while the caterer cannot afford to accept too little as food prices may fluctuate or labour costs may increase, and the caterer must deliver a quality product to preserve not only their image but that of the airline.

Manufacturers/suppliers who prepare food for the airlines also take advantage of economies of scale to purchase raw goods for the manufacture of airline meals, desserts, beverages and snacks. These suppliers can produce meals for economy class much more cheaply and efficiently than can most flight kitchens, hence catering companies tend to buy these meals from vendor/suppliers.
Distributors play dual roles for airlines and caterers. They obviously distribute materials and meals from vendor/suppliers and they can track numbers, volumes, brands and hence quality of food for the airlines. The airlines want value for their money. One of the ways in which they ascertain value is through establishing with the caterer and the vendor certain brand and manufacturing specifications. Because caterers and airlines purchase such volumes, it is essential that someone can track purchasing, receiving and the utilisation of products for the production of airline meals.

The interaction of the players, the airlines, the caterers, the manufacturers/suppliers and the distributors is the key in providing quality food service to passengers on airline carriers. These four components of the industry must communicate and work in agreement to achieve excellence in their endeavours. More than any other industry, these constituents are interlinked. It is difficult to separate clearly the functions of these players as roles and responsibilities overlap. The overlap and the co-operation found in this industry are what make it so interesting.

References