

Carriage Time Sensitive and Perishable Goods in the Air Transportation

Özhan Görçün^{1*}, Yaşanur Kayıkçı^{2**}, Ömer Faruk Görçün^{2***}

¹Bahçeşehir University Vocational School Department of International Logistics,
Besiktas, Istanbul

²Kadir Has University Vocational School Department of International Logistics,
Selimpasa, Istanbul

*ozhan.gorcun@bahcesehir.edu.tr

**kayikci@khas.edu.tr

***omerfarukgorcun@yahoo.com

Abstract

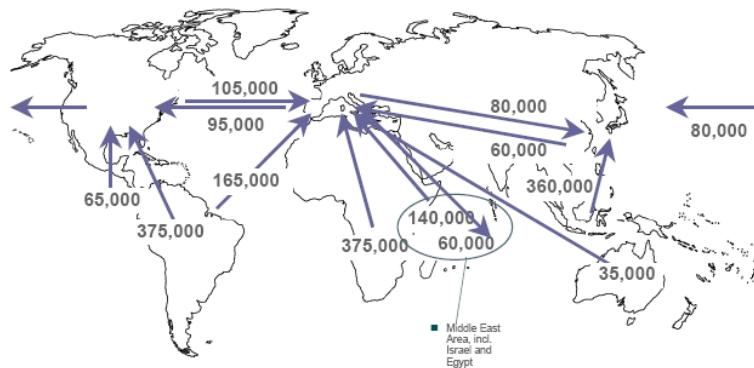
Perishable goods transportation has become a very important part of the logistics chain. The increasing requirements of rapid transportation and delivery in chilled and frozen products via air cargos have necessitated new terms and regulations in the cold chain management. Since the carriage of foodstuffs has an important impact on public health, air cargo companies have to take utmost care while packaging and moving goods and to protect them against leakage, spillage and contamination from other cargos. Nowadays, many air cargo companies use both thermal (refrigerated) and general-purpose aircraft containers to transport perishable goods, whose standards were determined by IATA (International Airline Transportation Association) and national safety regulations. This study will focus on effective transport and handling techniques for time and temperature sensitive commodities by providing optimum, cost-efficient packaging methods in the air cargo shipping industry. In 2000, 90 Million tons chilled and frozen goods were transported throughout the world where 3 Million tons of these types of goods were carried by air cargos which corresponded with 5% of total perishable goods transportation. The portion of perishable shipments and delivery to the market via aircrafts will be expected to grow dramatically in the next few years as airline transportation is becoming a more viable option. After changes in airline regulations, especially in domestic flights, the emphasis on these criteria is to increase the understanding of the need to maintain temperature and safety conditions.

Preface

One of the noticeable points of the carriage of perishable foodstuffs by air cargo is the loading of similar products that require the same temperature level. In the case of any condition not being adhered to, commodities that can damage each other should not be loaded in the same carrying containers/cases. Especially at the beginning of the carriage it is important to meet key hygiene standards and

potentially hazardous products have to be eliminated as far as possible, nonetheless existent cold chain conditions in the air transportation should not be broken. This means that during the process of carrying, storing and transferring, required temperature should be provided at the same level in order to protect products.

Before products being loaded into the aircraft, collected samples would be tested by independent laboratories; products which are risky for the air crew health should certainly not be loaded. On the other hand different products should be isolated from each other during loading; moreover those suitable carrying containers/cases have to be kept clean, cool and closed during the whole length of the operation. In addition to this point, if it is necessary to take products out from containers/cases by reason of control and analyze them, only small quantities of products may be allowed to be removed and the rest of the products should be kept in the cool house. Thermal control circuits have to be enabled between 4 and -40 °C in the cooling system of air transport devices. Especially fish, meat, milk, fresh fruit, vegetables and other food products should be evaluated differently and put into operation separately; moreover processed foods may never ever be carried together with fresh foods.



Source: Boeing, YDL, ITC Stats, FAO, USDA, Airports Data, Customs, Kaiser Associates, Lufthansa Consulting

Figure 1. Perishable Goods Transportation in World

Cargo Operations with Airway

In 1910, since the first air cargo transportation, air cargo market has developed and it has become key factor of transportation sector. Annually, 300 billion ton cargo is carriages with airway around the world. At the same time, 25.000 freight forwarder and 700 airlines operator give a service in this sector (1). Several important components have dominated to air cargo markets. Especially integrators are very important factor for this sector. Such as Turkish Airlines, MNG Cargo and Pegasus etc. these operators can be determine to market conditions and prices (2).

Export by air is more expensive than by sea and gives poorer temperature control. Its only advantage is speed. Spending less time in transit, perishable products have less time to deteriorate. Rapid transport permits shippers to supply specialty demands, such as those for early season or highly perishable fruits, and to satisfy the demands of the market more accurately. For valuable products air freight may also be chosen as part of a 'just-in-time' system, simply because it gives a quicker return on capital that is 'tied up' during transport. Surprisingly, it has been found that the intrinsic value of an item has little to do with whether or not it is air freighted. The deciding factor is not price, but 'mark-up' and profit, which depend on the balance between supply and demand.

The main component of the cost of air freight is the capital cost of the aircraft. Airlines, therefore, seek to minimize the time their aircraft spend on the ground. Cheaper freight rates are offered for cargo which is consolidated into unit loads (on pallets or in containers, known as unit load devices), because aircraft can then be loaded and unloaded more quickly and delays to aircraft are prevented by requiring cargo to be ready for loading 2 hr before the scheduled departure time (3).

Some airlines are organized primarily to carry passengers and their baggage, and use surplus cargo space for freight, at marginal cost. Others are oriented more towards freight. Some, mainly charter companies, carry only freight. The cost of air freight depends largely on the gross weight of the consignment. There is a strong disincentive, therefore, to use refrigeration or even insulation, and the advantage of speed may be lost by poor temperature control. To a lesser extent the cost also depends on distance, but this is moderated by commercial considerations. Unit loads may be carried at a fixed freight rate (within the weight limitation of the device), rather than by weight.

About 10% of normal freight does not move on the flight on which it was booked (2). This may be because of the substitution of a smaller aircraft, because a late arrival leaves insufficient time to load, or because additional fuel is required for stronger-than-normal head winds. On most services freight is accepted at several priorities, charged at different rates. A premium service, offered at a higher cost, guarantees arrival on the next flight. A budget service may take up to a week. In calculating freight rates, airlines and their agents also take into account market forces such as competition and supply and demand. Freight is rarely in balance; 'rack' freight is often carried at a reduced rate, sometimes as low as the marginal cost. While this can provide cheap rates for limited quantities, it inhibits expansion of freight services because additional freight requires additional aircraft, at the full, not the marginal, cost.

Air freight differs from surface transport in that most air freight is booked with third party agents, rather than directly with the airline. Most airlines see their business as flying aircraft and prefer freight to be booked and consolidated by freight forwarders, who handle about

Türkiye 10. Gıda Kongresi; 21-23 Mayıs 2008, Erzurum

90% of international air freight worldwide. The freight forwarder chooses an appropriate airline, reserves space, arranges collection of the cargo, prepares the documentation and consolidates into the cargo unit loads. After the flight the freight forwarder arranges customs clearance and delivery. Freight forwarders usually operate from their own depots near the airport. Those who specialize in perishable cargoes may install cool rooms at their depots.

Conclusion

Current technologies such as controlled atmosphere warehousing are a necessity especially for developing countries. An increased shelf life of up to 50% through the use of ethylene control in storage will allow particularly fruit and vegetables to be provided in the countries of origin even outside of the peak season. This enables peaks driven by crop cycles to be smoothed/spread while making products available for just-in-time delivery to the consumer markets in immaculate, fresh condition throughout a longer period of time. Definitely, such opportunities exist and first attempts to change some of the current business structures have already been made. Whilst, again in the case of flowers, perishable centers have earned good money with value adding services like cutting or bundling, producing countries have recently begun to operate their own facilities close to airports or even within the airport facilities, offering the same specialized services yet at a different step along the value chain. Taking advantage of their normally lower costs, the business prospects and cost saving potentials for retailers are appealing.

References

- 1.Paul W F. 2006. "Electronic Integration in Air Cargo Industry: An Information Processing Model of On Time Performance" Hong-Kong University of Science and Technology, Hong-Kong .
- 2.Fleming J, Malcolm Hofsdal, N, Gilbert B. 2005. "Automatic fresh air exchange system" Syracuse, NY.
- 3.Rohde C, Claus D, Malik KA. 1995. "Packing and shipping of biological materials: Some instructions, legal requirements and international regulations" World Journal of Microbiology & Biotechnology, 11 (6,) 706-710.
- 4.Paul CS, Eric I, Brian W, Thomas A. 2007. Noyes Countywide Air, Rail, Water, and Port Transportation System Study Transportation Research Board of the National Academies Volume 1602 / 1997, p: 4-13.