

Quality of Live Animal Transport Services to Enhance Competitive Advantage in Air Cargo Business

Punya Heedjun¹ and Nipawan Poojom²

^{1,2}Lecturer, College of Logistics and Supply Chain, Suan Sunandha Rajabhat University, Thailand

*Corresponding author

E-Mail: ¹Punya.he@ssru.ac.th, ²Nipawan.pu@ssru.ac.th

Abstract.

This research aimed to: (1) study the characteristics of users of air transportation services for living organisms; (2) analyze the problems associated with the air transportation of living organisms; (3) examine the service processes of living organism transportation in order to enhance competitiveness in the air cargo transport business; and (4) propose guidelines for improving service quality in the transportation of living organisms to strengthen competitiveness in the air cargo transport industry. A mixed-methods research design was employed. The quantitative research population consisted of 385 users of air transportation services for living organisms, selected using purposive sampling. For the qualitative research, seven key informants were selected based on the criterion of having at least three years of experience in air transportation of living organisms. Research instruments included questionnaires and interview guides. Data were collected through both primary and secondary sources. Data analysis involved descriptive statistics, including percentages, means, and standard deviations, as well as content analysis.

The research findings revealed that opinions regarding the service process of living organism transportation were at a high level. The highest-rated aspect was the transportation of living organisms, followed by delivery and transportation preparation, respectively. Overall, service users demonstrated a high level of confidence and satisfaction with the living organism transportation service process, particularly in the transportation phase, which received the highest evaluation. This indicates that transportation operations were appropriate, safe, and capable of caring for living organisms in accordance with expected standards. Guidelines for improving the quality of living organism transportation services should focus on the systematic development of service processes, covering transportation preparation, in-transit control, and final delivery. Emphasis should be placed on enhancing safety standards and animal welfare, developing personnel competencies with specialized knowledge and skills, applying technology to monitor and control environmental conditions during transportation, and improving effective communication with customers. In addition, management systems should be developed with flexibility to respond promptly to customer needs and comply with international standards, thereby fostering trust, satisfaction, and sustainable competitive advantage in the air cargo transport business.

Keywords: Service quality, Air transport of living things, Business Competition

1. Introduction

Air transportation of living organisms has increasingly developed under strict standards to ensure the safety and welfare of living organisms throughout the journey. This mode of transportation is used for various purposes, such as relocating pets, transporting animals for exhibitions, moving living organisms for scientific research, and supporting wildlife conservation. Particularly for long-distance transportation, air transport is considered the most appropriate option in terms of time efficiency, speed, and safety. The International Air Transport Association (IATA) has established clear standards and guidelines for the air transportation of living organisms, covering appropriate cages or packaging, the provision of food and water, environmental control during transport in accordance with health and safety principles, as well as health inspections and required documentation such as vaccination records and health certificates. These measures aim to ensure standardized operations and reduce potential risks (Wix.com, 2019).

Furthermore, technological advancements play a significant role in enhancing the quality of air transportation services for living organisms. The adoption of environmental monitoring sensors, systems for tracking temperature and humidity, and tools for assessing the well-being of living organisms during transit, together with the development of personnel capabilities through specialized training, enable professional care and effective management of potential situations. These factors contribute to increased safety, comfort, and confidence among service users. However, despite air transportation being considered a more humane and safer option than other modes of transport—especially over long distances—there are still cases of injury and mortality among animals during air transport. This reflects that general safety measures may not be sufficient to fully protect the welfare of living organisms, highlighting the need for heightened caution and stricter control measures.

In addition, service users must have adequate knowledge and understanding of the characteristics of living organisms eligible for transportation in accordance with airline regulations. Generally, animals transported by air must be at least two months old, in good health, free from disease, and not considered high-risk for air transport. Particular attention must be given to brachycephalic breeds, such as Pugs, Bulldogs, and French Bulldogs, which are more susceptible to respiratory problems when exposed to changes in air pressure. Temperature is another critical factor, especially during hot weather while animals are waiting to be loaded onto aircraft, as this may lead to heat stress or heat stroke and potentially life-threatening conditions. Therefore, service users should be aware of flight schedules, transportation procedures, and necessary preparations prior to departure (Visuthinan Panja, 2021).

Based on the significance and background discussed above, the researcher recognizes the importance of providing effective air transportation services for living organisms through management processes that emphasize quality control and welfare protection throughout the transportation process. Nevertheless, by analyzing existing problems and relevant factors, the researcher aims to enhance the efficiency of transportation processes and contribute to benefits

for both service users and service providers by improving skills and strengthening operational capacity.

2. Literature review

Parasuraman, Zeithaml, and Berry (1988) further proposed criteria for evaluating service quality by developing a service quality model that applies marketing concepts and emphasizes customer acceptance of superior service quality. Service quality is therefore considered a critical factor in creating differentiation in service delivery. Similarly, Buzzell and Gale (1987) described service quality as a complex concept that depends largely on consumer attitudes, commonly referred to as customers. The ability of a service business to respond effectively to customer needs is essential, as service quality represents one of the most important factors for gaining competitive advantage. Delivering service quality that meets customer expectations is fundamental, as customers are satisfied when they receive what they want in the manner they desire.

In this regard, Sudarat Pimolratnakarn, Wiroj Jedsadarat, and Jantana Saensuk suggested that improving service quality in the transportation of living organisms requires effective innovation management capabilities. This is particularly challenging because innovation must originate directly from individuals within the organization. If an organization seeks to transform into an innovation-driven organization, it is necessary to encourage innovation-oriented behaviors among executives at all levels as well as employees, especially frontline staff. Their study found that key factors influencing innovative behavior include granting employees autonomy in their work, allowing them to design tasks, determine directions, and make decisions independently. Such autonomy fosters learning and leads to successful performance. Additionally, employees' perception of organizational support plays a crucial role in stimulating innovation, which ultimately contributes to improving the quality of living organism transportation services by enhancing efficiency, safety, and responsiveness to customer needs.

Concepts and Theories Related to the Transportation of Living Organisms

Luong Le (2012) stated that the concept of animal welfare aims to promote proper care and well-being of living organisms in terms of physical condition, mental health, development, and natural environment. This concept seeks to prevent inappropriate treatment of animals, recognizing that animals are sentient beings capable of experiencing feelings similar to humans. Although animals may not live in the same manner as humans, they require appropriate knowledge and training as fundamental elements for a suitable quality of life. Importantly, animals should not be subjected to pain or suffering resulting from human use or exploitation. This concept is widely recognized by professional veterinary organizations, including the American Veterinary Medical Association.

According to Noreen Lanza (2014), the International Civil Aviation Organization (ICAO), a specialized agency of the United Nations with 193 member states, works in collaboration with the International Air Transport Association (IATA) in regulating the air transportation of

animals such as dogs and cats. IATA has developed the Live Animals Regulations (LAR) to ensure safe and humane transportation, with a strong focus on appropriate packaging and animal health care. These regulations are reviewed and updated annually to enhance transportation efficiency and safety.

Furthermore, regarding the detailed regulations for animal transportation under the Live Animals Regulations (LAR), Noreen Lanza (2014) explained that ICAO, established under the Convention on International Civil Aviation (the Chicago Convention), serves as a specialized UN agency overseeing international civil aviation through cooperation among its 193 member states. ICAO works closely with IATA, a global trade association representing approximately 290 airlines worldwide. Cooperation between ICAO and IATA plays a vital role in developing standards and recommended practices for civil aviation, ensuring efficient, coordinated, and effective international air transport operations.

IATA, representing international airline operators, has issued the Live Animals Regulations (LAR) as a comprehensive guideline for the air transportation of living organisms. The primary objective of these regulations is to ensure that animals are transported safely and humanely throughout the entire transportation process.

3. Methodology

Research Design. This study employed a mixed-methods research approach. Both primary and secondary data were collected and subsequently analyzed using content analysis.

Population and Sample. The quantitative population and sample for this study consisted of 385 users of air transportation services for living organisms. The sample size was determined using the formula proposed by W.G. Cochran (1953), with a confidence level of 95% and a margin of error of $\pm 5\%$. Based on this study, the researcher determined the sample size to be 385 respondents at a 95% confidence level. For the completeness and appropriateness of the study, purposive sampling was employed to select the sample.

Qualitative Research (English Translation – Academic Style)

For the qualitative component of the study, purposive sampling was employed to select participants for in-depth interviews. A total of seven key informants were included, in accordance with the guidelines proposed by Creswell (2018), who suggested that phenomenological or explanatory qualitative research typically requires between 3 and 10 interview participants.

This study applied triangulation to compare and verify research findings from multiple sources and perspectives, including two entrepreneurs involved in the transportation of living organisms, three supervisors and operational staff, and two users of living organism transportation services. This approach was adopted to enhance the credibility and validity of the data and the research findings.

The selection criteria for key informants were as follows:

1. Entrepreneurs involved in the transportation of living organisms with at least five years of experience.

2. Supervisors and operational staff in living organism transportation with a minimum of five years of experience.

3. Users of living organism transportation services with at least three years of experience.

Data Analysis (English Translation – Academic Style)

Quantitative Data Analysis

Part 1 consisted of questions designed to collect demographic information of the service users who responded to the questionnaire. These included name, telephone number, gender, age, educational level, occupation, and average monthly income. Respondents were allowed to select only one option for each question. The data were analyzed using descriptive statistics, including percentages and means.

Part 2 comprised questions related to the service process of living organism transportation, including the preparation process, the transportation process, and the delivery process. The data were analyzed using descriptive statistics, namely percentages, means, and standard deviations (S.D.).

Qualitative Data Analysis

The researcher reviewed the completeness of the interview data obtained from key informants and analyzed the data using content analysis. The findings were then used as a basis for data interpretation, discussion of results, and formulation of conclusions and recommendations in subsequent sections.

4. Results

Results of the Study

This research on the air transportation of living animals presents the results of quantitative data analysis collected from 385 service users, as well as qualitative data obtained from in-depth interviews with key informants. The findings of the study are summarized in accordance with the research objectives as follows: 1) Results of the study on the characteristics of users of air transportation services for living animals The analysis of general characteristics of the service users revealed that the majority of respondents were male and under 30 years of age, accounting for more than half of the total sample. Most respondents held a bachelor's degree, were self-employed, and had an average monthly income ranging from 10,001 to 30,000 baht. These findings indicate that the primary users of air transportation services for living animals are working-age individuals with sufficient knowledge, understanding, and the capacity to make informed decisions when selecting services that meet high standards of safety and reliability.

2) Results of the analysis of problems related to air transportation of living animals. The qualitative data analysis indicated that, in the past, air transportation of living animals faced several limitations, particularly the practice of transporting animals in the aircraft cargo hold. This method limited close supervision of animals and exposed them to potential environmental risks such as inappropriate temperature and humidity, as well as stress caused by travel, even when owners had adequately prepared cages, food, and water.

However, air transportation of living animals has continually improved in recent years. Many airlines have revised their policies to allow pets to travel in the aircraft cabin under clearly defined conditions. This development helps reduce animal stress and enhances service users' confidence. Nevertheless, key challenges remain, including regulatory restrictions, the readiness and health condition of animals, the use of non-standard transport containers, and limitations in animal care during transit. These issues require strict control measures and effective management practices.

3) Results of the study on service processes for transporting living animals to enhance competitiveness in the air cargo transportation business. The analysis of service users' opinions regarding the overall service process for air transportation of living animals showed a high level of satisfaction. This reflects strong user confidence and overall satisfaction with the services provided. When considering each dimension separately, the transportation process received the highest mean score, followed by the delivery process and the preparation process, respectively.

These results indicate that the operational procedures during transportation are appropriate, safe, and capable of caring for living animals in accordance with expected standards. Such factors are essential in building customer trust and enhancing the competitive capacity of the air cargo transportation business, particularly for enterprises specializing in the transportation of living animals, which requires specific expertise.

4) Guidelines for improving service quality in the transportation of living animals to enhance competitiveness in the air cargo transportation business. Based on the findings from both quantitative and qualitative analyses, the researcher concludes that key approaches to improving service quality in the transportation of living animals should prioritize safety and comfort for the animals. Emphasis should be placed on providing care comparable to that given to one's own pets, as this approach fosters positive impressions and encourages service users to reuse the service.

Furthermore, continuous development of service processes is essential, particularly in terms of technological advancement, safety control, and animal welfare protection. Examples include the use of intelligent tracking systems, artificial intelligence (AI), X-ray scanning systems, and environmental control during transportation. In addition, collaboration with relevant organizations such as the International Air Transport Association (IATA), the Department of Livestock Development, and customs authorities is necessary to ensure compliance with international standards. These efforts will contribute to enhancing service quality, strengthening

customer confidence, and improving the long-term competitiveness of the air transportation business for living animals.

5. Conclusion

Discussion of Findings According to Objective 1 To examine opinions regarding the process of air transportation of living organisms

The results of the data analysis revealed that users' overall opinions toward the air transportation process of living organisms were at a high level ($\bar{x} = 4.06$, S.D. = 0.24). When considering each dimension, all aspects were rated at a high level, particularly risk management ($\bar{x} = 4.11$, S.D. = 0.13). This indicates that service users place great importance on safety, systematic procedures, and effective risk control throughout the entire process of transporting living organisms. Qualitative findings from key informants further indicated that air transportation of living organisms must strictly comply with regulations, particularly concerning animal health conditions, age, pregnancy status, and readiness prior to transportation. Such compliance is essential to prevent risks and potential problems during transit. These findings are consistent with risk management principles in the aviation industry, which emphasize strict standards and safety as core operational priorities.

The findings are consistent with the study by Nida Supharangsarn (2017), which found that service processes and management factors significantly influence decision-making in airline selection among international freight forwarders. In addition, the findings align with the research of Panumas Niamplub (2020), which highlighted that personnel competency and attentiveness are critical factors that enhance operational efficiency in the air cargo transportation industry.

Discussion of Findings According to Objective 2 To analyze the problems associated with air transportation of living organisms

The findings indicated that, in the past, air transportation of living organisms faced several limitations, particularly the practice of transporting animals in aircraft cargo holds. This method restricted close supervision and exposed animals to unsuitable environmental conditions, such as temperature fluctuations, humidity changes, and stress during travel, even when owners adequately prepared cages, food, and water. These issues are consistent with the study by Wisuttinan Panja (2021), which identified limitations in laws and regulations governing animal welfare in air transportation. The study emphasized that existing regulations do not sufficiently cover animal welfare dimensions, particularly the freedom from pain, injury, disease, fear, and distress. Such regulatory shortcomings directly affect animal welfare and may result in injury, suffering, or death during transportation.

Therefore, the findings highlight the necessity of improving legislation, regulatory frameworks, and operational practices related to air transportation in order to ensure effective animal welfare protection and alignment with international standards.

Discussion of Findings According to Objective 3 To study the service process of air transportation of living organisms in order to enhance business competitiveness

The findings revealed that air transportation services for living organisms have continuously evolved to improve animal welfare. Many airlines now allow pets to be transported in the passenger cabin under clearly defined conditions, such as weight limits, breed restrictions, and required documentation. These measures enable owners to monitor their animals closely, reduce stress during travel, and enhance user confidence. Moreover, improvements have been made in environmental control systems during transportation, including temperature and humidity regulation, hygiene management, and strict document verification to prevent illegal activities. These practices align with international guidelines promoted by organizations such as the International Air Transport Association (IATA), which aim to systematically elevate standards for animal transportation.

These findings are consistent with the research of Wisuttinan Panja (2021), which proposed the development of specific legal and regulatory frameworks for air transportation of animals to ensure clarity in operations and effective protection of animal welfare. Such developments contribute to increased user trust and long-term competitiveness of the business.

Discussion of Findings According to Objective 4 To propose guidelines for improving service quality in the air transportation of living organisms to enhance business competitiveness

The results indicate that a key approach to improving service quality in air transportation of living organisms is to prioritize comfort, safety, and animal welfare. Given the primary advantage of air transportation in terms of speed, such improvements help minimize losses and risks associated with transporting living organisms. Enhancing service excellence by caring for animals as if they were one's own pets can foster customer satisfaction, trust, and motivation to reuse the service. Additionally, the adoption of modern technologies—such as intelligent tracking systems, advanced safety control systems, and integrated data management can further improve service quality and better meet market demands.

These findings are consistent with the study by Huang, Bulut, and Duru (2019), which emphasized that service quality, rapid responsiveness, and customer relationship management are key factors in achieving competitive advantage in the international logistics and freight forwarding industry.

Acknowledgment

1) Practical Recommendations for Agencies and Service Providers in the Air Transport of Live Animals

2) Agencies and service providers should enhance safety standards and risk management throughout the entire transportation process. Risk management should be prioritized by strictly complying with international regulations and standards, such as those of the International Air Transport Association (IATA) and the International Civil Aviation Organization (ICAO). This includes systematic health checks, assessments of readiness, and verification of required documentation for live animals prior to transportation, in order to prevent risks and unforeseen incidents during transit.

3) In addition, the capacity and competencies of relevant personnel should be continuously developed. Service providers should offer specialized training for staff in areas such as animal welfare and handling, emergency situation management, and professional communication with service users. Such measures will help enhance user confidence and overall satisfaction with the service.

Recommendations for Future Research

1) Future studies should examine additional factors that influence customer satisfaction and decision-making in selecting air transport services for live animals, such as pricing, corporate image, brand trust, and user experience, in order to obtain a more comprehensive understanding of service selection behavior.

2) Future research should also expand the sample to include service providers and users at the international level. This would enable comparative analysis of practices and standards for live animal transportation across different countries and contexts.

3) Moreover, experimental or comparative research designs should be employed to investigate the effectiveness of new technologies or innovative service models applied in the air transport of live animals, thereby contributing to evidence-based improvements in service quality and operational efficiency.

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