

Quality management for the international transportation of non-human primates

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Summary

Safe and humane transportation of live animals requires dedicated, informed personnel who carefully plan and attend to the details of appropriate animal care and handling throughout the shipping process. Specifically, although transportation of non-human primates shares goals common to all live animal transport, it also poses unique challenges stemming from the nature of these animals. Some of these unique challenges of transporting non-human primates, include the impact of public perception of non-human primates as cargo, maintaining biosecurity of non-human primate cargo, safety of both the non-human primate and public contacts, meeting the vital husbandry needs of varying species of non-human primates and compliance with numerous regulatory agencies, which may have overlapping responsibilities. This discussion will focus on these important considerations, as they relate to the legal international transportation of non-human primates for scientific use.

Keywords

Biosecurity, CITES, Convention on International Trade in Endangered Species of Wild Fauna and Flora, IATA, International Air Transport Association, Non-human primate, Primate, Transportation, Welfare, Zoonoses.

Gestione della qualità nel trasporto internazionale dei primati

Riassunto

Un trasporto umano e sicuro degli animali vivi richiede un personale attento, informato che pianifichi scrupolosamente fin nei dettagli l'appropriata custodia e cura degli animali durante tutto lo spostamento. In particolare il trasporto di primati benché affine al trasporto di animali vivi in genere, pone una serie di problematiche uniche legate alla natura peculiare di questi animali. Alcuni dei problemi specifici da affrontare legati al trasporto di primati sono l'avversione dell'opinione pubblica a considerare i primati come semplice "carico", tutelare la biodiversità dei primati, la sicurezza sia dei primati che di quanti entrano a contatto, andare incontro alle necessità di un'attenta gestione delle diverse specie di primati, e in conformità alle diverse agenzie normative, che possono avere sovrapposizioni di responsabilità. La discussione si concentrerà su queste importanti considerazioni, in relazione alla normativa sul trasporto internazionale di primati utilizzati a fini scientifici.

Parole chiave

Associazione internazionale sul trasporto aereo, Benessere, Biosicurezza, CITES, Convenzione sul commercio internazionale delle specie di flora e fauna in via di estinzione, IATA, Primati, Trasporto, Zoonosi.

Introduction

International transportation of non-human primates is essential to support the efforts of medical research, as well as zoological conservation efforts. When discussing this topic, it is important to remember that the classification of primates includes apes, monkeys and prosimians. There is a vast diversity amongst non-human primates in regard to their physical and physiological characteristics; such differences will have an impact on the management of these animals during transportation.

The focus of this paper will be on non-human primates that are required for scientific research, as this group comprises the majority of non-human primates that travel internationally. Research primates most commonly include the macaques, baboons and marmosets, although other species are used occasionally. Even within this restricted group, the diversity of animals is exemplified by the range in size. An adult marmoset may weight 350 g to 500 g; an adult baboon may exceed 30 kg. It should be pointed out that non-human primates proportionally constitute less than 0.25% of all laboratory animals used in the United States and Europe. However they make a valuable and unique contribution to the advancement of medical science. Healthy defined research non-human primates are used in studies that investigate cures for AIDS, malaria, hepatitis, Parkinson's disease, Alzheimer's disease and other improvements to the quality of human and animal health.

Non-human primates used in research are often bred and sourced from Asia, Africa, Mauritius or South America and must be transported by air across very long distances to Europe or North America. The vital supply of these animals hinges on the availability of air carriers and ground crew that can meet the goals of safe, secure and timely delivery of the cargo, in compliance with regulatory guidelines. Over the past 16 years, many international air carriers have refused to transport non-human primates. Currently Chinese air carriers continue to proficiently manage shipments from Asia. However,

animals originating from other continents are left in a more tenuous and difficult situation. This has forced some importers to turn to chartered air transportation, which is costly. Chartered air transportation has been used frequently in recent years to import animals to the United States from Mauritius.

Management of international air transport of non-human primates requires consideration of regulatory compliance, human and animal safety, security of the cargo, humane transport and issues related to the public perception of non-human primates as air cargo. Each of these items will be addressed.

Regulatory compliance

Regulatory requirements for legal transport of non-human primates may include international, national and, in some cases, even local procedural compliance. Communication is a key to meet all handling and permit requirements at the point of export, during transit and upon receipt in the importing country. In many instances, handlers, shipping and receiving parties must be properly trained, licensed or registered with government agencies that oversee this practice. Documentation and permits from various entities may often overlap in scope, requirements and enforcement. It is important to ensure that an intended shipment non-human primate cargo meets all necessary regulations.

The primary goals of organisations that oversee non-human primate transportation, include the following:

- providing for safe and healthy transport of the animals
- assuring safeguards to public and agricultural health
- upholding conservation efforts by monitoring the trade in protected species.

International organisations leading the way in the management of non-human primate trade include the International Air Transport Association (IATA) and Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

CITES is an international agreement that is intended to protect specimens of wild animals and plants from trade that may endanger their survival. One hundred and sixty-nine parties (countries) are signatories of the CITES resolution and are bound to the implementation of this resolution. Each country designates a management authority to oversee the CITES importation, exportation and re-exportation permit process. In the United States, this duty performed by the United States Fish and Wildlife Service. It should be noted that, in the context of CITES, international 'trade' applies to commercial or non-commercial trade. Animals covered by the CITES treaty are listed in one of three appendices. Wild caught species of non-human primates are listed in both Appendix I and Appendix II. However, Appendix I non-human primates bred in captivity for commercial purposes at a facility registered with CITES, are considered Appendix II specimens, for permit purposes. All non-human primates of feral origin are listed in Appendix II, if not listed as 'threatened with extinction' under Appendix I. Most non-human primates used in scientific research are included in Appendix II and require a CITES export permit from the country of derivation, but not an import permit for the consignee.

CITES and the World Health Organization have deemed that the IATA Live Animal Regulations (LAR) be employed as guidelines for the air transportation of animals. The LAR are updated annually and help to ensure proper transport containers to prevent the escape of animals, injury to animals and humans, and to provide instructions that meet the husbandry needs of non-human primates in transit. The LAR have been adopted by the European Union as minimal standards for transporting animals. In the United States, the LAR may be more restrictive guidance than stated in the Animal Welfare Act.

Safety and security

Safety issues related to non-human primates in transit are the safeguarding of animal cargo and human contacts. Non-human primates

consigned to an air carrier must be free of contagious disease, apparently healthy, and competent to travel. An exclusion based on competency may be related to an animal's state, such as pregnancy, physical debility or being too young. Most non-human primates used for scientific purposes are bred in captivity and have a known or defined health status; based upon observation and some diagnostic testing. A valid health certificate, signed by a veterinarian, must accompany the shipment.

Unique aspects of non-human primate behaviour must also be considered in planning the safe travel of the animals. These are wild animals and they can manipulate objects with great dexterity. They are quick, inquisitive, relatively smart and exhibit great strength in relation to their size. Furthermore, they are very social animals and are often socially competitive with con-specifics.

Non-human primates should generally be placed in crates in individual compartments. This facilitates observation, monitoring and care of each animal during transit. Individual compartment crating also reduces injury, as even 'friends' may fight with each other under the stress and changes experienced in transit.

Under transport circumstances, non-human primates may naturally try to escape from their enclosure. This may lead to self injury, or may expose personnel to injury (those handling crates to move them or to access feed or water ports). The potential for bites, scratches and direct exposure of personnel handling non-human primates must be minimised. The design and integrity of crates is an important component of a safe travel experience. The primary enclosure must be strong enough to withstand the rigours of transit and must also provide adequate ventilation. Crate design should allow animals to stand, sit and turn comfortably, but should not allow too much leverage for animals to push out compartment walls, or exterior sides. Crates should be clean, leak-proof and allow feed and water placement by personnel, without enabling contact with any part of the animal or allowing the opening of the compartment door.

While crate design should allow animals to be observed in transit, crate walls are typically solid and ventilation openings should be covered with a mesh that is small enough to prevent animals from protruding any part of their body. The typical shipment of non-human primates or research involves building the crates up on a 'cookie sheet' pallet, which precludes individual observation of all crated animals. Ventilation openings may be covered with a light muslin cloth. However, the use of specific crate filtration or barriers (such as an over-pallet container) between the interior and exterior is not common practice for non-human primates. This raises issues of biosecurity for the animal cargo; that is, maintaining the known health status of non-human primates during transit.

Biosecurity of non-human primates in transit involves physical segregation of different cohorts of animals. Ideally, only one shipment of non-human primates would be present as live animal cargo aboard a plane. If the shipment must be trans-shipped, a consignment of non-human primates should not share warehouse space with other animals. Attention should focus on the prevention of cross-contamination during administration of feed, water or care. The reasons for this may not be immediately obvious. Different species of non-human primates may appear healthy, but may harbour viruses or other infectious agents that can cause serious disease in another species of non-human primate. Examples include macaques exposed to healthy Patas monkeys harbouring simian haemorrhagic fever virus or healthy African green monkeys infected with simian immunodeficiency virus. Furthermore, even the same species of non-human primate from different origins, or vendors may have different viral profiles. Naive animals exposed in transit, to conspecifics, carrying infectious pathogens in a latent form, could become infected and suffer devastating disease or loss of value for research purposes. For example, some macaque colonies are specific pathogen-free (SPF) for type D simian retrovirus (SRV), which makes them especially valuable for certain research applications. SRV is not of

zoonotic concern, but is highly transmissible amongst macaques and could cause illness and loss of value if contracted by naive or SPF animals.

Non-human primates should also be restricted from public access to prevent possible infectious exposure of both them and the human contacts. Curious people, without personal protective equipment or training, who attempt to interact with valuable non-human primate cargo, may cough, or otherwise expose animals to illness. Furthermore, non-human primates could touch, scratch or otherwise expose unauthorised, unmonitored personnel in random contact with the crates, to the transmission of zoonotic disease. In this regard, personnel authorised to handle non-human primate cargo, must receive instructions on the proper use of protective clothing and the reporting of any deviation from expected procedures. An additional concern in the security of cargos of non-human primates relates to the activities of animal rights groups. The possibility that such groups may tamper with the cargo, or target personnel involved in the shipment, should be addressed as part of the mitigation and response phases of emergency planning.

Humane transport

Humane transport of non-human primates requires meeting the animal's physical needs relative to the provision of feed and water provisions, conditions in both the interior compartment and the exterior environment, timely delivery and other efforts to reduce animal stress. Knowledgeable personnel must be involved in all phases of shipment from crating to in transit care, and managing the animals during trans-shipment or receipt. A plan for emergency response at each step should be prepared. This plan should consider delays related to equipment failure, or personnel problems and animal concerns such as deaths or escapes.

It should be realised that some of the controls of non-human primates transported by ground carriers do not apply when animals are

consigned to air transportation. This places greater emphasis on the planning necessary when primates are relocated by long distance air transportation. Non-human primates transported by truck are generally accompanied by specified feed and water and are placed in temperature controlled cargo bays with remote monitoring. Ground shipments may have the same handlers from start to finish. Long distance air itineraries may include trans-shipping and placing animals in a holding facility en route. It is especially important to provide appropriate and quality feed, water, to have personnel trained in the use of protective equipment and sanitation and to place crates in restricted areas where environmental temperatures are not allowed to reach extremes of cold or heat. Furthermore, ground personnel should be instructed to connect cargo bays to ground air conditioning facilities at the time of loading, during stop-overs and as soon as the plane docks at the final destination. Detailed plans for shipment management should include the names of responsible contact personnel at each stage of the itinerary, including the point of departure, during all stops-overs and upon arrival at the final destination. This information should accompany the shipment and be made available to all involved in the shipment.

Just as we humans may experience some stress during long international air travel, so do non-human primates. The reduction of such stress to animals should be a constant effort. Planning should work to reduce the occurrence of rapid or extreme temperature changes, loud and unfamiliar noises (such as from jet turbines), contact with unfamiliar animals, changes in daily light cycles and even exposure to unfamiliar odours such as jet exhaust. It is crucial to remove occupied animals crates from the tarmac to a sheltered staging area immediately and without delay as shown in Figures 1, 2 and 3.

Dealing with public perception

A major obstacle to safe and reliable air transportation of non-human primates is the impact of the public's perception of these



Figure 1
Offloading a pallet of crates containing non-human primates onto rollers placed on a lift



Figure 2
Personnel at Houston Intercontinental Airport receiving several pallets of monkeys from Mauritius and in the process of moving them from the tarmac to a sheltered staging area



Figure 3
Ground handling of a pallet of monkey crates

animals as cargo. There is definite confusion in the message about risks surrounding non-human primates. When one mentions that a baboon is being transported, some people may think of a ferocious wild male baboon, whereas others may conjure an anthropo-

morphic image of Raffiki, the mandrill from Disney's *Lion King*. Furthermore, popular press releases occasionally show pet or wild monkeys or apes, with relatively unknown health status, in amusing interactions with the public – all are apparently unaware of the possibility that these animals may cause serious injury due to aggression or possibly transmit zoonotic agents such as simian B virus, *Shigella* spp. or tubercle bacilli. Alternatively, under a regulatory eye and in the best industry practice, cynomolgus monkeys for research are handled in transit by trained staff wearing extensive protective equipment. The public, including the transport crew, may be startled to see how the shipment is received at the airport. Workers are gowned and wear gloves and masks, as shown in Figure 4. They may convey perceptions of a public health threat. It should be pointed out that the use of such protective gear is to safeguard the health of both the humans and



Figure 4
Personnel in full protective equipment unloading crates containing non-human primates from a ground vehicle at the final destination

the non-human primates. Nonetheless, such concerns can have a negative impact on the public image of the air carrier and the safety of transporting these animals. It is of utmost importance to communicate, and instruct as necessary, to allay such unfounded fears. Even in a practical setting, misinformation and erroneous perceptions of non-human primates for research are common. Uniformed ground cargo personnel may refuse to handle non-human primate crates. Often, the perception by uniformed personnel is that non-human primates for medical research must carry a dangerous illness to which a new proposed treatment will be applied to evaluate efficacy. The opposite is true. Primates for scientific research must be healthy subjects to provide valid results and are tested for freedom from the agent of tuberculosis and other pathogens.

Concerns of air carriers are not limited to public relations issues. Carriers that transport non-human primates come under attacks from animal rights groups which have specifically targeted major commercial carriers and airports. The carriers are also accountable in regard to the meeting of certain regulatory guidelines and face fines and public notice if they are found not to comply with the handling of non-human primate cargo. Many major air carriers have refused to accept non-human primate cargo due to these burdens and the concern for loss of public support. There is a need to continue to work with international air carriers to inform them of the practicalities of transporting non-human primates and the critical need for these animals in research.

Further reading

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