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Flying Piglets - Observations of an Ethologist

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1. Introduction

"A flying piglet" raises the suspicion of too high a permillage of either alcohol or oxygen in the blood. "Flying piglets" however is a job, causing a number of us a lot of problems. Therefore some observations, made by an outsider may give you one or two helpful hints, or at least lighten the burden of your conscience. This outsider is an applied ethologist, having worked with pigs for 25 years. His observations regarding pigs may be right, his remarks regarding aircrafts and airports are less reliable.

Because one flight is only one research unit, and because only two flights were involved, this contribution can only be seen as a case history. The project was necessary because of the high number of casualties in transporting piglets from Amsterdam to the Far East.

The objectives of the investigations were to find out where the problems arose for the transported piglets, and what possibly could be done to avoid such problems in a subsequent transport.

2. Working procedure

In 1983 KLM (Royal Dutch Air Lines) used to transport piglets in the hold of B 747's. Relatively small groups of specially designed containers were used to ship 100 - 200 of piglets of about 22 kg from Schiphol-airport to Manilla or to Kuala Lumpur. At arrival sometimes 10 % of the valuable animals were dead. The reasons for this had to be found, because at that time this type of transport was attractive. The air line companies were short of freight and the farms of destination could more easily handle several hundreds of piglets at a time than thousands of them transported by a special charter.

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We considered it necessary to accompany the piglets from their pens at their farm of origin to the airport of Amsterdam. We observed them during waiting and loading on the airfield. During the entire flight we monitored their behaviour by means of a closed TV-circuit and video recording. We could measure the CO_2 percentage in the containers at every moment and record air humidity and air temperature during the whole flight. During stops we had a quick glance at the animals. At arrival we observed unloading and transfer to a lorry. Then we followed the lorry to the farm of destination, observed unloading and reception of the animals. The day afterwards we returned to the farm for another look at the piglets, to see the effects of post shipping stress and to talk to the vet in charge and to the owner.

In order to keep things simple and because of the limited amount of time available, this contribution is a mixture of observations and suggestions. For the same reason no references are given.

3. Preparations for transport

Every transport causes a considerable stress for the animal involved. Pig transport in general is difficult. However, experience tought us one rule: "Limit the number of simultanious stressing situations as much as possible!" Keeping this in mind, actions taken in the country of origin (Belgium) shortly after midnight (the flight was scheduled for about 12.00 hr that day) were inadequate. In order to keep the piglets quiet they were given an injection with a tranquillizer (azaperone). The therapeutic effect of azaperone lasts for about 4 hrs. However, the hangover takes about 24 hrs. Except for that, tranquillizers like azaperone reduce the function of the lungs and of the heart. This is allright if an animal can ly quietly in its pen, but not if it has to be physically fit for a transport in a too cold or in a too hot environment. Heartrate and lung functions also control the cooling system of pigs, located in the snout and larynx.

In general pigs in a stressful situation calm down by the company of other pigs, especially pen mates. Other comforting factors are the presence of light and acquaintance with the environment. As air transport acts as a long lasting stress (counting the period from the farm of origin to the farm of destination), tranquillizers only calm down pigs for a short period. If used repeatedly, hangovers accumulate, leaving us with a seriously ill animal. So we better look for less detrimental long lasting effects. Advantage can be taken

at the farm of origin by already constituing the groups that will fly together in one container.

Long before the actual transport takes place, air companies know how many containers they will use and the available area per container. By informing the farm of origin, they can take good advantage of this, by grouping pigs in pens like they will be in the containers. On the first day, these pigs will fight. This effect will be restricted since they are on their own farm and on their own food. If they are grouped according the containers, they should be temporarely eartagged so that they can be recognized at every stage of the transport. The grouping for transport should be done one week in advance, in order to establish the social relations within the groups. This week should also be used to introduce the same drinking system as will be used in the containers (information to be given by the air line companies). If at loading the piglets show fresh scratches or show signs of ear-biting, tail-biting, lameness etc., the transporter should make up a report before leaving. This report (in duplo) should be signed by the person in charge on the farm and by the transporter, and each should receive a copy. The same should be done at the airport by the representative of the air line company and the transporter. Only in this way, the air line company can avoid being blamed for the damage after the flight.

The day before transport pigs should only have a light meal, but have unrestricted access to water.

4. Transport to the airport

Piglets should be transported in groups, according to the groups they were in during there last week on the farm and will be during air transport. Generally a road transport previous to air transport will disturb the diurnal rythm of the animals (resting periods from midnight till dawn and from midday till four p.m.). All people involved in travelling by air, know the importance of disturbing the circadian rythm. This equally counts for animals.

If the animals did not know each other well, they will start to fight for social dominance during stops of the lorry, e.g. at the border or waiting for loading on the platform. Despite my advice, many pigs will be sedated. So anyway an air company deals with very tired animals, to begin with.

If the pigs have to wait for some hours before being loaded in the containers, it would be much better to unload them and keep them for that time in

pens with straw and with water. Of course, the groups have to stay together.

The electric prodder is out of the question in transporting pigs. It is a most stressing instrument. A skilled operator can reach the same goals by using a board. Also out of the question is using a ramp. The pigs are very tired and most probably never learned how to use a ramp. So, a loading platform, used as a lift is the only solution.

If sedated (again) at the airfield the pigs will be unable to use the drinking devices, and again we are building up an enormous hangover.

5. Loading

Loading the containers for transport by air, again requires some skilled handlers and a loading platform, no ramp and no prodders. By using ramps and electric prodders we just make pigs panic. We have to be very careful that there are no gaps between the connection of the loading platform and a container. The (still) tired pigs might slip in with a leg and hurt themselves. Never a floor may be slippery or unstable.

At our investigations at both flights there were gaps between the platform and the container. The piglets were sedated and prodders were used. Sedated pigs hesitate to move. Apart from this the piglets had a lot of scratches on ears and neck. Thus they had been fighting considerably during the composition of groups. The scratches were fresh. They also fought on the lorry, waiting for the loading procedure. Because of the wind and rain, they obviously were cold and were lying in a heap between periods of fighting.

The floors of the containers consisted of coated metal with perforations, covering a mattress of absorbent material. The coating should prevent slipperiness. As this was not effective, before loading the containers into the aircraft sawdust was provided additionally.

6. On board

Each container held 25 - 30 piglets. Because the floors of the containers were covered with a thick layer of sawdust (± 10 cm), a second perforated floor was placed on top of this layer. During the first transport this second floor appeared not to be quite stable. Because such a situation means great discomfort to the piglets, it was adjusted on the next flights. Each container had one or two drinking devices with a supply of 5 liters. They could not be refilled and were replaced on the next trip by large containers with water and

biting nipples.

Because of the monitoring of the behaviour of the piglets, the containers were dimly lit. The video recorder and other devices were connected with the electricity supply for medical purposes. Also the observer was sitting near that location, with an extra seat for the apparatus. His comment on the scenes on the monitor was taken on tape, as were typical parts from the behaviour. The observer had tubes, leading to the containers, allowing him to take air samples. The TV-camera in the hold and the dim lights were also connected with the electricity supply from the medical unit. Air temperature and air humidity were recorded in the containers by a thermo-hygrograph.

It must be realized, that even at the start of a transport by air, the pigs or other animals involved, are already very tired because of the previous transport by road. This showed in our situation in particular during the first part of the flight (Amsterdam - Athens). Whether sedated again or not the pigs did just lay flat, except for a short period during take-off, when they were standing. This lying was induced also by the fact that it happened in the mid-day resting period. However, the piglets' rest was disturbed very much by frequent sneezing. We blamed the very dry sawdust for this phenomenon. Because of the dry atmosphere (always a relative air humidity below 20 %) on board, the piglets had a more sensitive throat and the sawdust became air born because of drying out.

The flight from Athens to Dubai (15.00 - 19.00 MET) was characterized both times by drinking and fighting. On the first flight the water was finished in one hour after take-off from Dubai. After the water was finished the piglets went on fighting over the drinking nipples and sneezing increased. The temperature was too high for the piglets and some of them became oppressed in their breathing. Much conflict behaviour was observed in the form of "belly-nosing". This is a regression to a more juvenile pattern of behaviour, which indicates that the piglets can not cope with the situation. Quite a bit of sawdust was ingested. As we do not know the name of the trees, this sawdust originated from, eating sawdust must be avoided. The trees may have been venomous.

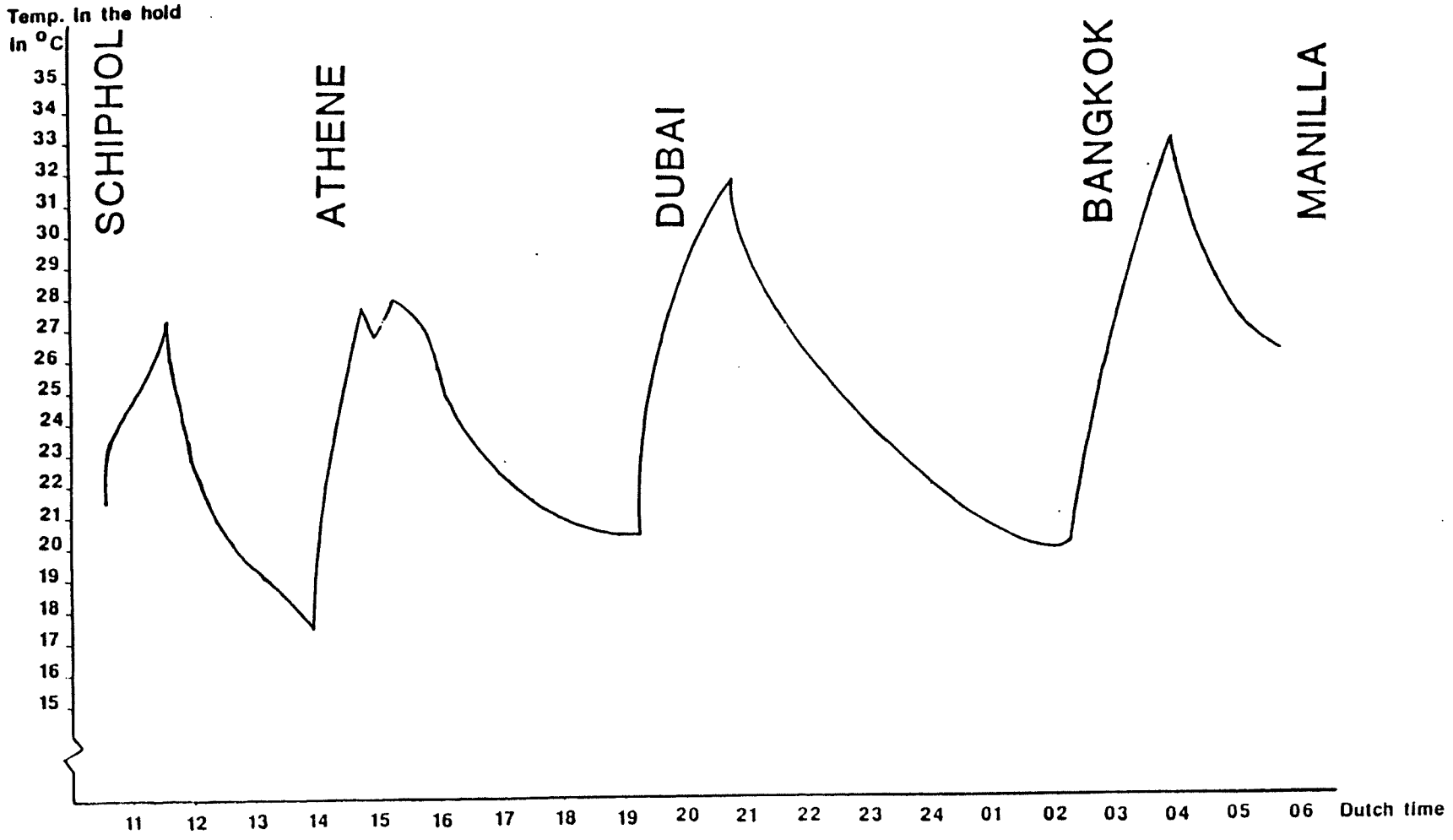

Figure 1. Temperature in centigrades in containers with piglets, travelling in the hold of a Boeing 747 from Amsterdam to Manilla.

The flight from Dubai to Bangkok (20.00 - 02.00 MET) could not give any relief to the piglets. The water containers were not accessible for refilling during the stop. (This taught us to enlarge the water containers considerably for the next flight. This action appeared to help). The pigs sneezed and fought over the drinking nipples until exhaustion. Again conflict behaviour ("belly-nosing") could be observed frequently. Some piglets were vomiting. Breathing frequencies increased till over 200 per minute. Only after midnight the piglets calmed down. It also became cooler in the hold (fig. 1).

The flight from Bangkok to Manilla (03.00 - 06.00 MET) was less difficult for the animals. We managed to unload the container in Bangkok and to refill the water containers. This is not a sinecure and takes a lot of time. However, the stretch from Bangkok to Manilla was used by the piglets to drink and rest. The panting decreased little by little.

On this flight and on the other one, the piglets in the containers were in a standing position during take-off and during landing. They did not slip, unless on the last stretch. This must be due to exhaustion.

The enlarged water containers on the next flight had no gauge-glass and the nipples were not adequate. In principle a gauge is only for making sure enough water is left. Refilling is practically impossible during stops. It is equally impossible to do something else for the piglets during an air transport.

8. Unloading

The arrival at Manilla airport was at about 14.00 hr local time. The sun was burning on the tarmac. The temperature in the sun was well over 40 °C in the sun (35 °C in the shade). Under these conditions we feared serious problems. However, we happened to be quite wrong.

The first thing after unloading the containers, was that they were situated under the wings of the plane. Thus they were in the shade. This is remarkable, because this action was on the initiative of the normal platform personel and had nothing to do with the reception of employees of the farm of destination.

After clearance by the authorities, the piglets were loaded (picked up by hand) on an open truck, devided in sections. The floor was covered with canvas, which was kept stretched. On this canvas cover, big lumps of ice were placed. By melting, the canvas was soaked with ice-water, allowing the piglets to stretch out on it, in order to loose heat. However, they were not allowed to drink. The transport took some hours, and the piglets were sprinkled with

water during the whole transport. This was done manually by a couple of boys, taking water out of two big barrels. The piglets were not protected against the hot sun.

9. Reception at the farm of destination

On arrival at the farm of destination, the pigs had been traveling for about 36 hrs. Meanwhile it had become dark, but it remained very hot with a high air humidity. The condition of the piglets had improved since they arrived at the airport. All pigs were alive.

At arrival on the farm, first of all the fitness of the piglets was checked. This was done by letting them walk towards a well lit pen, over a distance of about 10 meters. Those piglets unable to make it, were separated and received special care.

The other piglets were received in a spacy pen with a concrete floor. Lukewarm water was available. Vitamines, electrolytes and a broad-spectrum-antibiotic were added. Later that evening a light meal was presented. The pens were well lit during the whole night and two farm hands were supervising the piglets during the whole night.

Next days five piglets appeared to have died from post-shipping stress. The symptoms are a serious diarrhoe and refusal to drink. The animals die from dehydration. Losses of this kind can be expected until five days after arrival, the farmers veterinarian told us next day. On the second accompanied flight there were only two casualties because of postshipping stress. According to the veterinarian in charge, post-shipping stress was enhanced by serious fighting among the piglets, once they had more or less recovered from traveling. This is another plea to group the piglets well in advance (one week) on the farm of origin and to earmark them with coloured eartags, according to the group they are placed in. These groups should be left intact during every phase of the transport until two weeks afterwards.

The veterinarians regarded the bitten ears and tails as a result of the air transport. This opinion could be adjusted. However, it should be a warning for air companies that they will be blamed for all damages, no matter whether it has happened during the flight or not.

During inspection of the piglets next day, it was obvious that they were suffering from a jet-lag. Their behaviour (diurnal rythm) was completely out of phase, compared with the activity of the other pigs on the farm. The owner

of the farm used to treat them accordingly, with special food and feeding times. Thus they were gradually accustomed to a new rythm. Also the lights were kept burning during the first nights, and the treatment with antibiotics was continued for two weeks.

10. Discussion

This paper is based on observations of two flights with piglets from Amsterdam to Manilla. The piglets were traveling in the hold. The observations included the trip from the exporting farm to the airport and the road transport from Manilla to the receiving farm.

As this report is based on two transports only, it is more or less reduced to a case history. However, because the observations were made by a scientist, with some decades of experience in the applied ethology of pigs, the conclusions do have more validity than a mere case report. As the conclusions are in accordance with more general information regarding the behaviour and health of pigs, even more significance can be attributed to the points being made.

As very little scientific knowledge about air transport of pigs is available, these limited experiences deserve being made accessible for people involved. No doubt after a number of years some conclusions will turn out to be essential. Other ones will be of less importance. For the time being even limited knowledge can be of some help.

11. Conclusions

Four main conclusions are drawn:

- In preparing an airtransport, also ethological implications should be considered, e.g. grouping well in advance and not disturbing this social relation until well after transport.
- Dehydration during air transport is a serious problem for pigs, an adequate supply of drinking water has to be available in the transport means.
- Developing countries are not necessarily the weak link in air transport.
- Air line companies should organise and supervise the transport from the farm of origin to the farm of destination.

These conclusions and other observations lead to the following detailed suggestions regarding air transport of young pigs.

. Pigs should be grouped and ear-tagged with coloured marks according the anticipated grouping on board.
. Pigs should not be treated with tranquillizers. These drugs decrease the physiological ventilation and cooling functions of the pigs involved. They also depress circulation and keep the pigs from drinking.
. During road transport to the air field, pigs should be grouped as they will be during the flight.
. Loading platforms should be available at the farm of origin as well as on the air field. Prodders are not allowed.
. No gaps are permitted at the conjunction of the loading platform and the containers.
. The floors of the containers should be stable and no sawdust should be used on these floors.
. In order to avoid slipperiness of the floors of the containers, a canvas cover can be glued on the metal.
. If possible the containers should be dimly lit during the whole flight, in order to calm down the animals.
. The water containers (gauges!) should contain a large enough quantity of water to supply the drinking nipples with plenty of water for the whole flight.
. In principle, nothing can be done for the pigs as long as they are on board. So everything should be prearranged.
. In the country of destination the groups of pigs (ear-taggs!) should be left intact for another two weeks.
. Pigs suffer from jetlags as people do. They should be gradually accustomed to the new diurnal rythm. This may even include well lit pens during darkness.
. In tropical countries, road transport from the air field can very well be realized by covering up the floor of a truck with stretched canvas. If necessary lumps of ice can keep the canvas cool, soaking it in ice-water. Of course damage to the animals by sliding lumps of ice must be prevented.
. After arrival at the farm of destination, the pigs should rest first and only get a light meal after some hours.
. Because of the (post-shipping) stress, piglets are very susceptible for infections of all kinds. Thus dayly inspection by a veterinarian will be necessary during the first two weeks.

. As the flight cannot be isolated from the other parts of the transport, flight companies should supervise and organize the transport from farm to farm.
. Flight companies should not accept wounded animals (ear-biting, tail-biting). They will be blamed anyway.

12. Summary

Because of a too high percentage of losses, two air transports from Amsterdam airport to Manilla were observed in 1983. These observations started at the farm of origin (in Belgium) and stopped the day after arrival at the farm of destination.

As small numbers of animals are much easier to handle in developing countries, on each flight about 130 piglets were transported in four special containers in the hold of a Boeing 747. On board the behaviour of the piglets could be observed via a monitor. Parts of it were recorded on video. Temperature and relative air humidity were recorded continuously, as was a spoken comment on the behaviour. Samples from the air in the hold could be taken and analysed at any moment.

Some general conclusions from the case histories are:

- The pigs were heavily drugged with tranquillizers. These have an adverse effect in their condition.
- Instead of using tranquillizers, pigs should be grouped about one week before transport and stay in the same group until two weeks after transport. This is the ethological way of calming pigs.
- Dehydration during air transport must be prevented. Water containers with plenty of water for the whole flight (with gauges) should ensure adequate water supply.
- Developing countries are not necessarily the weak link in air transport.
- Air line companies should organize and supervise the whole transport from farm to farm.

13. Acknowledgement

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