

PANTING

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A bird's respiratory system has some similarities to our own. Like us inhaled air travels down a central windpipe, which then opens into a set of lungs. There are, however, several important differences.

One difference is that birds do not have a diaphragm. The diaphragm is a muscle sheath that separates the abdomen from the chest in mammals. When it contracts this creates a negative pressure in the chest cavity causing air to rush down the windpipe into the chest. Birds have to create this negative pressure by expanding the chest wall itself. Also, in birds the ability of the respiratory tract to heal after infection or injury is considerably reduced when compared to mammals. Another major anatomical difference is the presence of air-sacs in birds

Air-sacs are regarded in an evolutionary sense as primitive structures. Despite this however, they do give the bird's respiratory system some amazing functional advantages. Air-sacs are transparent balloon-like structures that open off the lungs. They occupy a significant amount of internal body space, which means that much of the bird is literally filled with air and therefore comparatively light. This makes flight easier. Also, because of the nature of air flow through the air-sacs, fresh air can enter the lungs both during inhalation and exhalation in birds, making for very efficient oxygen delivery to the tissues. This is part of the reason why pigeons have the stamina and speed that they do. Fast humans can run 100 meters in 10 seconds, while a good greyhound can run 300 meters in 16 seconds but compared to a pigeon they are 'stuck in third gear'. Pigeons can not only match the greyhound's fastest speed but maintain this velocity for hours and hours and, of course, they can fly even faster if they want.

Panting to keep cool

Apart from being involved with buoyancy and indirectly with oxygen delivery to tissues, the air-sacs are also integral in maintaining normal body temperature and fluid levels in birds. Birds do not have sweat glands and so cannot cool themselves by evaporation of moisture from their skin. When hot, their principle metabolic option for cooling is to evaporate moisture from the lining of the throat and the air-sacs (in a similar fashion to an evaporative cooler). This is why, when pigeons become hot, they increase air movement over these areas by starting to pant. The increase in air movement over the air-sacs, in particular, leads to a significant increase in

moisture evaporation, which, in turn, leads to loss of body heat and cooling. Because this method of cooling involves the loss of moisture, it is vital that panting pigeons have access to water to replace the lost fluid, otherwise the birds will start to become dehydrated.

When very hot, pigeons will also abduct their wings from their body and expose areas of skin to the air by fluffing their feathers.

Panting and Disease

Apart from panting to keep cool, panting can be a normal response to meet an increased demand for oxygen. Panting in race birds can indicate an exercise intolerance and can mean that they are unfit. Disease however can predispose to panting in a number of ways:-

1. Infection of the respiratory tract. Bacteria, fungi, Chlamydia, Mycoplasma and some viruses can all infect the respiratory tract. When infected, the respiratory tract is less efficient at moving oxygen into the blood stream. Because of this, an increased respiratory effort has to be made, leading to panting.
2. Injury to the respiratory tract. The most common injury is bleeding into an air sac. This is usually the result of an impact injury where a flying pigeon hits an object or another pigeon in the flock while flying.
3. Diseases that sap energy. Other problems that may initially appear very unrelated to respiratory function such as coccidia and wet canker can predispose the birds to panting. Coccidia can lead to anaemia (lowered numbers of red blood cells), interfering with oxygen delivery to tissues and a lowered total protein in the blood, leading to a loss of stamina, premature fatigue and panting. Other diseases act by simply interfering with the development of fitness, leading to poor exercise tolerance and a predisposition to panting.
4. Diseases that interfere with air sac distension. Tumours, enlarged organs, cysts, fat or even an egg can all occupy space within the body cavity. These prevent the air sacs distending. Because the bird still needs to exchange the same amount of air but can only take shallow breaths, the respiratory rate has to rise, leading to panting.

Panting not associated with disease

Not all birds that pant are unwell. Panting can occur in a healthy bird if it is hot. Panting will also occur in healthy birds that are forced to fly if they are fat, unfit or moulting heavily. A short burst of exertion such as that which can occur with a falcon attack can make even a healthy and quite fit bird pant for a short period.

Panting In Young Birds

A common concern of fanciers who contact the clinic during January, February and March (the post-weaning time in Australia) is that their birds are panting and reluctant to fly around the loft. They are concerned that the birds may have a respiratory infection. This is reasonable because birds with a respiratory infection are more inclined to pant. However, more often than not, during this time of year, the panting is associated with other factors. The weather at this time of year is often hot while the growing young birds have yet to develop any real fitness. At the same time, they are moulting which can lead to increased effort involved with flight. As discussed above other diseases such as wet canker and coccidia can sap energy causing fatigue leading to panting on exertion.

Whether the birds are overweight or at a difficult stage of their moult can be determined by handling. Exercising the birds in a cooler part of the day will allow a fancier to determine if the panting is heat related.

Panting, however, does alert the fancier to the possibility of a respiratory problem. If panting is associated with inflammation of the deeper respiratory structures (such as the air-sacs), it is usual to also see signs of inflammation of the upper respiratory structures (ie the sinuses and windpipe) which may include watery red eyes, swollen sinuses, nasal discharge and also sneezing. If signs consistent with upper respiratory tract inflammation are not apparent, it is less likely that any panting observed is due to inflammation of the deeper structures such as the air-sacs.

Often, however, signs of a respiratory infection can be very subtle. This is particularly so in older youngsters where a reasonable natural immunity may have already formed. All that may be noticed here is an increased level of panting coupled with a subtle decrease in flying in a team that had been flying the loft well. In these older youngsters, sneezing in particular is a good indication of low-grade sinus irritation. If respiratory infection is suspected, a veterinary visit and health check are indicated.

Panting and Aerobic Exercise

Healthy fit birds that are forced to fly hard for a short period of time will pant. They do this to compensate for the oxygen deficit created by the burst of activity, in the same way that a marathon runner will pant for a short period of time if forced to sprint. We see this in lofts where the birds experience repeated falcon attacks. Birds in such situations are often reluctant to leave the loft but when forced to do so often fly in tight hard circles around the loft, being reluctant to range in case they are surprised by a falcon while away from their loft. In most Australian States, February to May are the months that hawk and falcon activity is highest. The fear that establishes itself in some teams is obviously quite high because some will continue to fly like this even when hawk appearances decrease, almost as if the behaviour has become a habit. Often the only answer is to short toss the birds for 7 to 10 days. This breaks the habit by building up the birds' confidence while at the same time giving the birds adequate exercise.

After any exercise period, there may be individual birds that pant. These are usually birds that for one reason or another are finding it hard to keep up with the others. These individual birds should be examined for signs of injury or illness. I have always believed that panting in a few birds as the team lands from a training toss is a good sign. This often means that the team as a whole is fit and are happy to push as hard as possible to get home. For these birds, tossing enhances their fitness. The few birds that are 'not quite right' struggle to keep up with them. These birds should be evaluated to ensure that there is no underlying disease problem. Healthy but unfit birds will recover quickly in themselves and their droppings will remain normal. Tossing unwell birds tends to exacerbate their illness. This means that their recovery from the training toss will be prolonged and their droppings may change to green or green and watery. The muscles of birds that are healthy but worked beyond their fitness capability or of birds forced to work when unwell are inclined to become bluish and increase in tone due to cramping.

Panting During Racing

Because panting is the healthy pigeon's natural way of cooling itself, panting will be observed

in birds during the racing season when they are hot. This means that healthy birds that are exercised on hot days will pant. Similarly, it is possible to see birds panting while resting in the loft during the heat of summer. However, if during the competitive season a team that has been going well suddenly starts to pant, this may be an indication of respiratory infection. This is particularly so if the sudden increase in the amount of panting is accompanied by a reluctance to fly or other signs of airway inflammation, such as sneezing. Because by the time racing has started the birds are older, their natural immunity is already quite high. As a result their response to disease is considerably modified. This means it is unusual to see the more obvious signs of respiratory infection such as a 'one eye cold' or dirty cere. Often all that will be noticed are vague signs of respiratory tract inflammation such as sneezing and panting. A sudden reluctance to fly coupled with sneezing and panting warrants a veterinary health check.