Ammonia - How sensitive is your nose?

AMMONIA (AN UPDATE)

Ammonia! Yes, it is the time of year again when the atmospheric concentrations of ammonia in free range houses can rise and cause problems. There are still people who say “Oh, it was a bit stuffy in the house this morning, so I flushed it out when I went there at breakfast time”. You didn’t like the smell of ammonia and you were only in the house for a few minutes. What about the poor old hens who were there all night and were longing for a bit of fresh air?

There is absolutely no excuse for subjecting the hens to concentrations of atmospheric ammonia that are higher than 25 parts per million (ppm). This is the maximum concentration for humans under the Health and Safety regulations and for the hens, 25ppm should be regarded as a maximum too. In practice, aim for a maximum of 15ppm. This should give a good balance between retaining the environmental temperature whilst preserving an ammonia concentration that you and the hens can live with.

Ammonia is caused by the bacterial breakdown of the faeces in the litter and in the pit. You want this to happen, so the ammonia is an inevitable by-product of keeping hens. The way to control the concentrations is to ensure that the ventilation is optimal.

a) For houses with fans, an interval timer that controls the fan(s) that give the minimum ventilation should be set to run for a short period on a regular basis, say once in every ten minute period. It is not good enough to rely on a thermostat to activate the fans when the internal temperature has risen. By then, in the autumn to spring period, the ammonia is likely to have risen too.

b) For houses that are naturally ventilated, there is no alternative to allowing the internal temperature to fall a bit, by allowing air into the house via the inlets and out at the ridge. It is a question of learning what size the inlet and outlet apertures should be, so as to get the optimal balance between trying to retain heat in the house whilst not allowing ammonia concentrations to creep up too far.

For about the last forty years we have been told that the optimum environmental temperature for hens is about 21°C (70°F). That is all fine and good for caged hens where there is a higher stocking density / cubic area of the house. However, for most free range houses in wintertime, it is often impossible to keep them this warm. Each hen gives off about 7 Watts of heat and even at a stocking density of about 11 hens / m², there are too few of them to raise the temperature very much within the house.
With the new obligatory stocking density of 9 hens / m², it is even more impossible to keep the hens at their optimal temperature. It is yet another case of legislation that is perceived to be in the best interests of the hens, but is in fact counterproductive. It is easier to get an optimal balance between ammonia and temperature in houses that have hens at more than one level. Using the cubic area of the house in this way increases the total heat given off by the hens, because of the higher stocking density. It should be easier to prevent the temperature from falling too far, even though the fan settings are such that the ammonia concentrations are controlled.

It is not all bad news if the internal temperature of the house falls to say about 15°C. Indeed, this is often much more desirable than trying to keep them warmer in cold weather. During the day when the pop-holes are open, it is inevitably difficult to keep the house warm. Therefore at night-time it is a very human and well-meaning action to try to keep the hens warmer, by reducing the timing on the fan control in houses with fans, or having inlet and outlet apertures that are too closed up, where there is natural ventilation. So what happens? The ammonia concentration rises and the hens are in a poor environment whilst the producer is snug in bed!

Assuming that the ammonia concentrations are elevated for the night-time period only, it is still of significant importance. Ammonia depresses feed intake and therefore egg weight. It also can inflame the trachea (wind pipe) in the hens and make them more susceptible to diseases such as Infectious Bronchitis. Therefore even though the hens will eat less (say 3g/hen/day) when the temperature is warmer at night-time, there can be advantages in allowing the temperature to drop a bit (say to 15°C), because a) Their feathering should be better; b) Their egg weight should increase by up to about 0.5g, and c) They are likely to be healthier.

In cold weather, a good manager will assess what the environment is in the house in the early hours of the morning and take note of the maximum and minimum temperatures and ammonia concentrations. Treat yourself to equipment that measures the ammonia. It could be money well spent and is a much more reliable guide than using your nose! Our noses tend to become de-sensitised when we are in free range houses frequently. If you think, “Oh, it’s a bit smelly in here today” and your eyes are beginning to water, the ammonia concentrations are almost certainly at concentrations that are bad for you and most certainly bad for the hens. Be proactive. Purchase an ammonia meter / tubes and check that the ventilation is optimal at times of the day when you are not normally there. A broken night or two is a small price to pay for increasing the chance of having a healthy and well feathered flock.