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## ***A Greener World Technical Advice Fact Sheet No. 16***

### **Nose Ringing Pigs**

Certified Animal Welfare Approved by A Greener World (AGW) has the most rigorous standards for farm animal welfare currently in use by any organization in North America. Its standards have been developed in collaboration with scientists, veterinarians, researchers and farmers across the globe to maximize practicable, high-welfare farm management.

#### **What is nose ringing?**

Nose ringing involves the insertion of a piece of metal or wire into the nose of a pig. The ring can be inserted into either the septum (the cartilage between the nasal cavities) or the disc (the flat circle of cartilage at the end of the pig's snout), as pictured below.



*Sow with multiple disc rings  
(and one septum ring)*



*Sow with septum ring*

#### **Why are pigs nose ringed?**

Pigs use their noses to root in the soil as part of their normal behavior. Outdoor domestic pigs in semi-natural environments spend about half their active time

exploring, and 40 percent of their exploration consists of rooting (Stolba and Wood-Gush, 1984). By rooting the pigs search for, locate and harvest food. Studnitz et al (2001) demonstrated that rooting is the preferred explorative behavior of pigs and that rooting behavior is considered to be a behavioral need of pigs (Horrel et al., 2001).

Rooting can be useful: for centuries, pigs have been used to clear undergrowth in woodlands or to dig up and destroy weeds. However, rooting can also lead to destruction of pasture land and, in some cases, environmental damage.

In addition, some farmers say that using nose rings helps to prevent farrowing sows from digging deep nests within the hut on some sites, minimizing the risk of her lying on her newborn piglets which can slip underneath her into the hole that she's dug.

If pigs are nose-ringed they cannot fulfill these behaviors because the ring causes pain when the pig tries to dig and root.

### **What do the Certified Animal Welfare Approved by AGW Standards say?**

The Certified Animal Welfare Approved by AGW standards prohibit nose ringing. However, the standards will permit one septum nose ring for breeding sows if it can be demonstrated that the activity of the sow would otherwise damage soil structure, cause environmental pollution, or compromise the welfare of the litter. No other pigs may be nose ringed and farms entering the program that wish to nose ring must be able to demonstrate the environmental or other risk factors, and why this cannot be managed in any other way.

### **Why the difference between disc rings and septum rings?**

Scientists have established that the pig's rooting disc has as many tactile organs as humans have on the palms of both hands (Adrian, 1943); it is very strong and very sensitive. Putting rings around the rim of the disk cause the pig more pain than inserting a ring into the septum. Where it has been established that environmental damage cannot be controlled by any means other than ringing pigs, a septum ring causes less pain while still restricting rooting behavior.

### **Why should we worry about nose ringing pigs?**

The debate surrounding the issue of nose ringing is whether it is a greater welfare issue to put a ring in the nose of a pig and stop the performance of some natural behaviors, or not to ring a pig and potentially allow damage to the environment. The Certified Animal Welfare Approved by AGW program has considered the evidence and believes that in most situations the benefit of ringing does not outweigh the pain and frustration it causes.

### Ringling and ability to feed

Scientific evidence suggests that ringling a pig does not simply stop it rooting – it also affects its ability to feed and other exploratory activities. Horrell *et al* (2000) tested the theory that pigs with nose rings picked up their normal feed, in the form of large roll nuts, more tentatively than unringed pigs. Their experiment timed pigs eating 20 roll nuts under different conditions: on a hard surface, on the surface of soil, on the surface of turf, embedded in soil and embedded in turf.

In all conditions ringed pigs took longer to eat their 20 nuts than did controls. The difference between groups was greatest when nuts were embedded. In addition, ringed pigs were more reluctant to root when nuts were embedded. The time it took before their first rooting action was delayed and, even after starting, a smaller proportion of the residual trial time was spent rooting. It was concluded that nose ringling depresses the efficiency with which pigs feed on solid feed.

### Ringling and other behavior

In a subsequent project Horrell *et al* (2001) looked again at ringling and its consequences for rooting, other functional activities and welfare. They state that if rooting is a behavioral need in the pig, and ringling is effective because it renders rooting painful, then nose ringling may represent a threat to welfare. They observed sows under three conditions: unringed controls, sows ringed with three wire clip rings through the snout rim (disc ringling), and sows with one bull ring through the septum. Ringling almost totally abolished penetration of the ground by rooting during the month after ringling. Rooting remained largely suppressed throughout the six months of observations in bull ringed sows, although substantial recovery of this function occurred in sows with wire clip rings – mainly due to the fact that the sows lost some of these rings (which were not reinserted).

Ringling was also shown to at least partially inhibit grazing, nosing in straw, digging out wallows and stone chewing. Ringed sows spent more time standing but otherwise inactive than the unringed controls, and displayed more straw chewing and digging at the soil with the forefoot.

The conclusion was that nose ringling in pigs inhibited a range of functional activities, as well as rooting, and elicited more behaviors that suggest a degree of reduced welfare.

### **Does other behavior make up for pigs not being able to root?**

It has been suggested that nose ringed pigs will carry out other alternate natural behaviors if they are unable to fulfill their need to root, and might therefore be less frustrated by their inability to root. Studnitz *et al* (2003) examined whether nose ringed

gilts, which could not root, could satisfactorily substitute rooting with other exploratory activities. The behavior of gilts – half of them nose ringed – was studied on undisturbed days as well on days of exposure to four different tests: delayed feeding, double feeding, removal to an unknown area, and finally removal to an unknown area supplied with a trough with stones.

On undisturbed days no significant differences were found between ringed and unringed gilts in terms of the overall levels of activity and foraging or exploring. However, the unringed gilts rooted significantly more than the ringed gilts. On an undisturbed day there was also no significant difference in the number of times ringed and unringed gilts were observed performing any behavior that could be considered a sign of frustration.

However, when exposed to an unknown area – something that would happen in a commercial pig unit – ringed gilts increased the levels of alertness and comfort behavior, which could indicate frustration. The conclusion formed was that in a stable environment ringed gilts might be able to substitute other exploratory behaviors for rooting in a satisfactory way. However, it was clear that those gilts that were able to root did so for a large part of their active time, indicating that the experience obtained by rooting was rewarding.

### **Can we reduce the damage?**

Researchers have looked at potential management options as an alternative to nose ringing pigs. For example, Bornett et al (2002) looked at ways of redirecting rooting behavior, while Braund et al (1998) tried to reduce paddock damage. However, neither of these projects really succeeded. Building on this earlier research, Edge et al (2003) devised a new experiment to identify new ways of simultaneously fulfilling the sows' innate desire to root and forage, while minimizing paddock damage.

Edge et al (2003) devised four 'treatments' in the experiment to examine how they affected the behavior of the pigs. Treatment A had no sacrificial rooting area in the paddock. Treatments B, C and D were all provided with a rooting area consisting of a strip of ploughed land. Sows in B received 5kg of swedes (rutabaga) per sow, spread over the surface of the paddock, in addition to their feed ration. Sows in treatment C received the same amount of swedes buried in the rooting area – again in addition to their feed ration. Treatment D also received 5kg/sow of buried swedes but their feed ration was cut by 0.5kg/sow to provide a diet that was the same energy level of that to that offered to the control sows in group A.

The results showed that sows which received swedes spent significantly less time rooting the paddock when compared to the control sows. When the levels of vegetation cover were assessed at the end of the trial the sows in group D – who had to dig up the

swedes in order to maintain the energy levels in their feed – had the highest level of cover. While this was not significantly different from the other three treatments (55 percent compared to 31 percent for group A, 38 percent for group B and 30 percent for group C) this work could be included as part of a strategy to reduce pasture damage in unringed sows. It shows us that if sows are given an area to root in like the ploughed strips in these trials – and if they are encouraged to root only in specific areas by burying part of their feed – then they will do less damage to the rest of the pasture.

Other research has highlighted the potential to reduce rooting behavior by some degree by providing the sows with a fiber-rich diet (Brouns et al, 1984; Martin and Edwards, 1994; Braund et al, 1998) and by a lower stocking rate (Andresen, 2000).

### **Positive mental state**

Edwards (2003) makes the following comment, which is relevant to the discussion on nose ringing pigs: “The emphasis of most approaches is generally the avoidance of poor welfare, rather than any attempt to address the concept of promoting positive feelings. Perhaps this is not surprising, as it is easier to measure stress than euphoria with our current scientific knowledge. However, a significant future issue will be whether good welfare is simply satisfaction of basic needs or should incorporate the concept of active promotion of positive mental state.”

This really comes back to what we are trying to achieve. Are we simply trying to avoid particular situations, or are we actively trying to improve the welfare of outdoor pigs? Allowing nose ringing is the easy option. We get a perception of good welfare, as the pig is kept on land with vegetation cover, but we have stopped the pig from performing part of its behavioral repertoire – and a key part at that. In addition, nose ringing causes acute and chronic pain which occurs during and after the operation to insert the ring. We also know that preventing rooting, which is such a key behavioural need, will cause the pig frustration. In addition, the Farm Animal Welfare Council (1996) state that the trust between the animal and the stockman is likely to be significantly affected by the carrying out of this stressful operation.

Not ringing is also problematic. We are allowing the pig to root but we are potentially allowing her to damage her environment. However, research shows that the potential to provide good welfare and promote the ‘positive mental state’ is greater in this scenario.

Ultimately, we need to decide whether having the sow in an environment where growing green food is not available on the range for part of the year is preferable to having her ringed – a permanent operation. As it is likely that the sow will be unable to carry out all her desired behavior in a barren environment, such as a bare field of mud, the question is whether or not the provision of other feeds such as silage or swedes at such times would help to compensate. To put it more simply, if a farmer kept his pigs in

the best welfare conditions for most of the year, except for a maximum specified period over the winter when bad climatic conditions resulted in the pigs being kept on an area of land with no growing vegetation (but with additional feedstuffs), would this be a better welfare outcome than permanently ringing the sow?

### **Practical options to reduce damage to pasture**

It is possible to keep pigs on pasture without ringing them. There are well-established techniques that can help to reduce damage to the sows' environment and many farmers are already managing their pigs without the use of nose rings and are successfully maintaining vegetation cover.

Nevertheless, this approach requires different management strategies, with a more frequent change of the outdoor area. Fields can be rotated, for example, between pigs and grass or corn crops. Modern huts are easy to move and movable electric fencing makes it easy to confine pigs. Well-designed huts and the provision of plenty of bedding will also minimize the problem of rooting and digging within the huts.

Farmer tactics include low stocking densities, the provision of forage such as baylage or vegetable waste, and the movement of animals around the land at short intervals. Such approaches do not necessarily guarantee cover over the land throughout the year, every year (climate of course pays a large part here). However, when combined with tactics suggested in the earlier research, such as buried low density feeds like swedes (rutabaga), these approaches could offer a way forward.

It is worth noting that anecdotal evidence from pasture based pig farmers suggests that nutritional status can have an effect on rooting behavior. Farmers have noted that when nutritional deficiencies are corrected – for example by addition of minerals to the diet – rooting behavior is reduced.

When setting up or moving a pastured pig enterprise careful planning and land management is important in order to avoid environmental damage. It is therefore important to consider the following points:

- Select appropriate sites
  - Soil type not too heavy
  - Rainfall not excessive
- Plan the overall system to avoid run off and erosion.
  - Think about where any watercourses are around the site
  - Think where rain water will flow
  - Don't overstock the land
- Plan paddock layout to suit site topography
  - Don't put huts in the path of rainwater run off

- Site water troughs and feeding areas away from ditches and water courses
- Manage the paddocks to avoid poaching and minimize run off
- Manage farm tracks to avoid polluting watercourses

*Keeping pigs on the right soil type and using regular rotation of the pig paddocks is the key to minimizing the impact of unringed pigs.*

## **Summary**

If our objective is to promote the best possible welfare for the pig then we cannot justify putting a ring through its nose. The scientific evidence is compelling. Ringing does not just affect the sow's ability to root, but also its ability to nose in straw and dig out wallows. Ringed sows display behaviors that suggest a degree of reduced welfare.

By adopting alternative management tactics we avoid the need for nose ringing in all but the most extreme cases. High fiber diets and extensive stocking are a good place to start. There are also good and bad systems that we can examine and learn from, and which will enable us to develop a system that meets both the pig's and the farmer's needs.

## **References**

Adrian E.D. (1943). Different areas in the brain of ungulates. *Brain* **66(2)** pp89-103.

Andresen, N. (2000). The foraging pig. Resource utilisation, performance and behaviour of pigs in cropping systems. Swedish University of Agricultural Sciences. *Agraria* 227 Doctoral thesis 105.

Bornett, H.L.I., Edge, H.L. and Edwards, S.A. (2002). Alternatives to nose ringing in outdoor sows: 1. The provision of a special rooting area. *BSAS Annual Meeting 2002* pp38.

Braund, J.P., Edwards, S.A., Riddoch, I. and Buckner, L.J. (1998). Modification of foraging behaviour and pasture damage by dietary manipulation in outdoor sows. *Applied Animal Behaviour Science* **56:2** pp173-186.

Brouns, F., Edwards, S.A., and English, P.R. (1994). Effect of dietary fibre and feeding system on activity and oral behaviour of group housed gilts. *Applied Animal Behaviour Science* **39:3** pp215-223.

Edge, H.L., Bulman, C.A., and Edwards, S.A. (2005). Alternatives to nose ringing in outdoor sows: The provision of root crops. *Applied Animal Behaviour Science* **92**:1 pp15-26.

Edwards, S.A. (2003). Animal Welfare Issues in Animal Production. *Proceedings of the NJF's 22<sup>nd</sup> Congress 'Nordic Agriculture In Global Perspective' July 1-4 2003, Turku, Finland* Available at: [www.njf.dk/njf/reports/njfreports.htm](http://www.njf.dk/njf/reports/njfreports.htm)

Farm Animal Welfare Council (1996). *Report on the Welfare of Pigs Kept Outdoors* <http://www.fawc.org.uk/reports/pigs/fawcptoc.htm>

Horrell, I., Ness, P.A., Edwards, S.A., and Riddoch, I. (2000). Nose rings influence feeding efficiency in pigs. *Animal Science* **71 part two**.  
[http://www.bsas.org.uk/Publications/Animal\\_Science/text/Volume\\_71\\_Part\\_2/259/](http://www.bsas.org.uk/Publications/Animal_Science/text/Volume_71_Part_2/259/)

Horrell, I., Ness, P.A., Edwards, S.A., and Eddison, J. (2001). The use of nose ringing in pigs: consequences for rooting, other functional activities, and welfare. *Animal Welfare* **10** pp3-22  
<http://www.ingentaconnect.com/content/ufaw/aw/2001/00000010/00000001/art00002>

Martin, J.E. and Edwards, S.A. (1994). Feeding behaviour of outdoor sows: the effects of diet quantity and type. *Applied Animal Behaviour Science* **41**:1 pp63-74.

Stolba, A. and Wood-Gush, D.G.M. (1984). The identification of behavioural key features and their incorporation into a housing design for pigs. *Ann. Rech. Vet* **15** pp287-298.

Studnitz, M., Jensen, K.H., Jorgensen, E. and Jensen, K.K. (2001). The effect of nose ringing on exploratory behaviour in gilts. *Submitted to Animal Welfare*

Studnitz, M., Jensen, K.H., Jorgensen, and E. (2003). The effect of nose ringing on the exploratory behaviour of outdoor gilts exposed to different tests. *Applied Animal Behaviour Science* **84**:1 pp41-57.

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## **KEYWORDS**



Pasture raised pigs, disk ring, septum ring, rooting, environment and natural behavior