

Peat as an bedding material - ensuring animal health, animal welfare and public health

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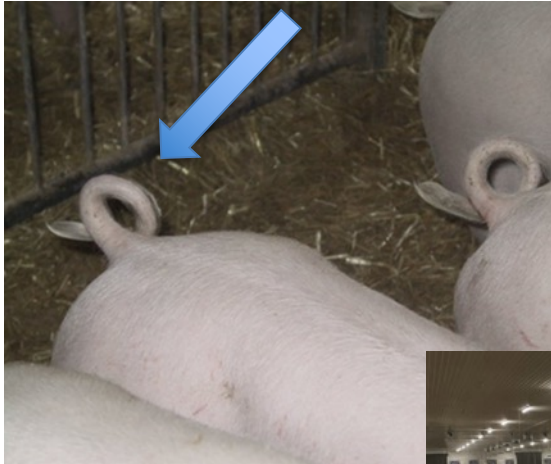


Peat in Finnish animal husbandry

As a **BEDDING MATERIAL** - In general use in several animal production systems

- Broiler/poultry halls, turkey halls
- Dairy cows – loose-house and tied-stall systems
- Beef cattle housing systems – outdoor and indoor systems
- Horse stables
- Pig production – loose-house pens of sows and breeding pigs
- Sheep production, fur animal production

Peat in Finnish animal husbandry



As an **ENRICHMENT MATERIAL** – better animal welfare, behavioural needs, decreases stress

- Peat as an enrichment material for 21,6% of pig farms (ETT, Sikava, 2019)
- Enrichment for poultry in meat production: broilers and turkeys

As a **IRON RESOURCE** for piglets to avoid anemia



MANURE

MANAGEMENT (SLURRY SYSTEMS, HORSE STABLES, WATER PROTECTION)

TACKELLING CHALLENGES OF ANIMAL HUSBANDRY (AVOIDING UNPLEASANT SMELL,, NEIGHBOURHOODS, FARMING CLOSE TO URBAN AREAS)

AS A FERTILIZER (BINDS THE NUTRIENTS FROM MANURE AND UREA, BETTER NITROGEN AVAILABLE FOR



Why peat for litter and bedding material?

- Binds moisture well
- ...and does it long
- Resists external changes
- Is hygienic and biosafe (traceable, known production chain, no residues, known pathogen situation)
- Availability (?)
- Easy to handle
- ...and storage



Kuva Siipikarjaliitto

Characteristics of peat for bedding material

Cons

- Dark colour -> "looks dirty"
- Dusty when spreading
- Quality can vary
- In outdoor systems possibility to freeze in winter



Photo Eeva Korimäki

Pros

- Extremely good capability to bind moisture/liquids (1m³ for 500-800 l)
- Warm
- Fluffy
- Acidity - pH ~ 4 (3,5-5): not optimum for pathogens (neutral pH 6,6-7,5 is)
- Ability to bind ammonia and hydrogen sulfite
- No need for immediate storage at farm
- Low contamination risk caused by harmful animals
- Easy to handle
- Quick composting → direct delivery to the fields

Peat and Mycobacteria?

Environmental Mycobacteria infections

– connected often for peat beddings...

Often subclinical in pigs

Only found in meat inspection at slaughter

Could be a risk for children and low immunity persons



Figure 7 (A&B). Mycobacterial growth was found in over 60% of used bedding material samples inside the piggeries.



Figure 8 (A&B). Mycobacterial growth was found in around 35% of unused bedding material samples outside the piggeries.
Kuvat: Taneli Tirkkonen

BUT all generally used bedding materials for pigs was found to contain Mycobacteria, as well in several samples of drinking water and feed (Tirkkonen Taneli, PhD Thesis 2027: Porcine mycobacteriosis caused by *Mycobacterium avium subspecies hominissuis*) -> **NOT A PROBLEM ONLY IN PEAT, OTHER MATERIALS HAVE THE SAME PROBLEM**

Peat and animal health and welfare?

Cattle as an example:

- **Udder health and milk quality**

Dairy cow lies app. 14 h / day → lying comfort and hygiene affect on milk yield

- **Peat beddings are dry, soft and acidious (cow comfort)**

Mastitis risk caused by environmental bacteria lower compared f.ex. non-hygienic-handled separated dry fraction or moist cutter swarf

-> *E. coli*, *Klebsiella*, *Streptococcus uberis* risk

- **Hoof health, skin, joints (no injuries, no pain)**
- **Cleanness at slaughter**

Dry bed ensures the clean animal



Peat and animal welfare?

Example of broilers' footpads

- Footpad index is an internationally approved evaluation to measure welfare of broilers
- Litter, ventilation, heating, intestinal health
- Studies of peat as a bedding material are quite few

PhD Thesis, University of Helsinki, 2017:

Kaukonen, Eija: Housing conditions and broiler and broiler breeder welfare: the effect of litter condition on contact dermatitis in broilers and breeders, and the effect of elevated structures on broiler leg health

- **Straw, peat and cutter swarf compared for beddings: condition was worse in straw than peat or cutter swarf**
- **Footpad lesions found less with peat bedding/litter**
- **No effect of bedding material for cleanness of birds**



Footpad lesions in broiler chickens

Practical tips on how to identify and prevent footpad lesions

Management Tools to Reduce Footpad Dermatitis in Broilers

By: Dr. Ingrid de Jong & Ing. Jan van Harn

Dr. Ingrid de Jong is the Senior Researcher in Poultry Welfare at Wageningen University (Livestock Research) in Lelystad, The Netherlands. She joined the University in 2002 as a Scientific Researcher and has served as the project leader and researcher of various projects in poultry and rabbit welfare. Recent research topics include: management to prevent mutilations in laying hens and broiler breeders; footpad lesions in broiler chickens; further development of Welfare Quality broiler welfare monitor; development of group housing systems for rabbit does. Dr. de Jong is a member of EFSA scientific panels on broiler and breeder welfare (2010) and animal-based measures in broilers (2012).



Jan van Harn, BSc, is a Poultry Nutrition Researcher and Account Manager for Broilers in the Animal Sciences Group of Wageningen University (Livestock Research) in Lelystad, The Netherlands. Since joining the Animal Science Group in 2003, he has led management trials with broilers on various subjects including: comparisons of lighting schedules and/or temperature schemes, and the reduction of footpad dermatitis through management. He has also conducted several environmental trials to reduce ammonia and fine dust emissions from poultry housing systems.

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Footpad index in Finnish broilers



Kuva: Suomen Broileryhdistys ry

Jalkapohjasta pisteytetään ihotulehduksen vakavuusaste vaurion syvyyden perusteella. Pisteet jaetaan kolmeen luokkaan 0, 1 ja 2. Luokka 0 vastaa tervettä jalkapohjaa, luokka 1 lieviä pinnallisia tulehdusmuutoksia ja luokka 2 syvää tulehdusmuutosta. Parven jalkapohjatulehdusarvioinnin tulos saadaan laskenta-kaavasta:

Jalkapohja-arvioinnin tulos J

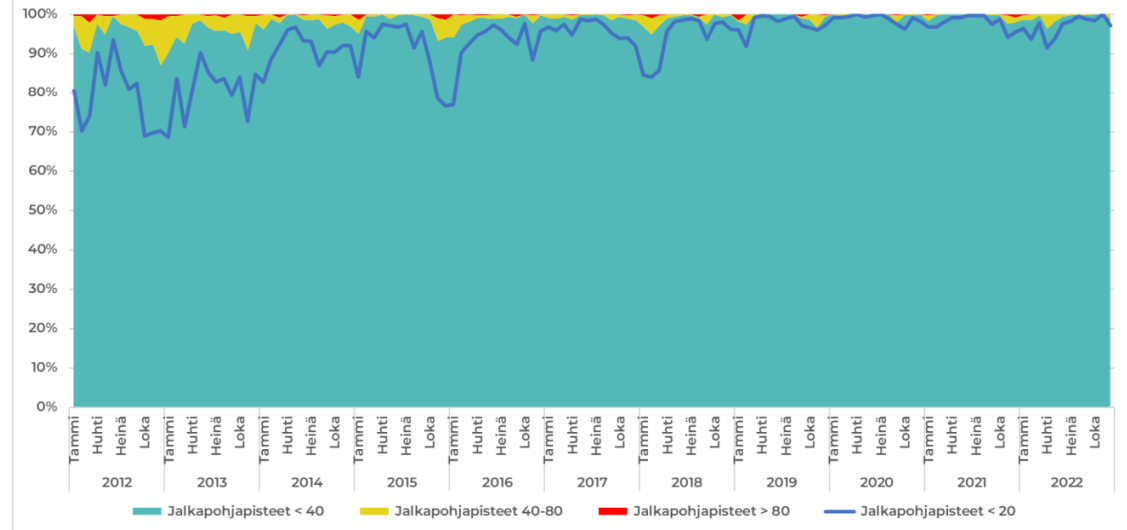
$$J = 100 \times (n_1 \times 0,5 + n_2 \times 2) / n_{\text{tot}}$$

Jossa
 n_1 on luokan 1 jalkojen lukumäärä
 n_2 on luokan 2 jalkojen lukumäärä
 n_{tot} on arvioitujen jalkojen kokonaismäärä



Kuva: Eija Kaukonen

Broilereiden jalkapohjaterveyden kehitys Suomessa 2012-2022



< 40 pistettä 2012 → 2019:

- Suomi 94,5 % → 99,1 %
- Ruotsi n. 70 % → 89 %
- Tanska n. 75 % → n. 90 %

Peat beddings and One Health



Focus on food safety and public health in Finland

- Need for antibiotic treatment is low -> production without using antibiotics is possible -> affects also by decreasing the risk for resistance
- Salmonella (pH-optimum 6,5-7,5) – In Finland we have a zero tolerance in whole food chain (control programs in legislation)
- Campylobacteria (pH-optimum 5-9) – major cause behind gastrointestinal infections in humans in EU
 - Campylobacteria: Broilers' batches **EU Ø 27,3%**, Suomi **2,5%** (2019)

Today's challenges for farmers...

- Production costs have increased strongly
- Reasons behind is the higher prices of energy and fertilizers, future depends on the harvest of cereals domestic and globally
- Reflects direct on feed prices, specially in pig and poultry sectors -> costs can rise intolerable, farm economy in crises, investments are consired even more carefully than before - who wants to be a farmer in future??
- CAP 2023 -2027? EU New Animal Welfare Legislation?



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PEAT AS A BEDDING MATERIAL IN FUTURE?

If price of peat is too expensive or difficulties to get any, connected to lack of new bedding materials, the uncertainty of the farming increases further

- > risk for lower production results, changes in the management risk animal health and welfare
- > risk for increased use of antibiotics
- > risk for comprehensive resistance situation



Do we have "NON-ANTIBIOTICS-USED" production possible in the future?

Conclusions...

- Conditions of environment of animals affect production directly
- Animal health and welfare affect the need for antibiotic treatments
- Safe and sustainable food production support public health and food safety
- Own domestic Finnish food production has to be maintained →but profitable!
- **There is no good alternative for a peat as a bedding material at the moment!**

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