



Reduction of heavy metal input - a task also for organic animal husbandry



Reduction of heavy metal input in organic animal husbandry

Structure

- **Situation of heavy metal input in agricultural soils**
- **Sources of heavy metal input in animal husbandry**
- **Potentials of reduction Cu and Zn**
- **The role of organic farming in reduction of heavy metals**
- **Summary**



The balance of heavy metal flux in Germany *

Cd	Pb	Cu	Zn
Input 5 g	86 g	270 g	1222 g
Deposition 50 % Fertilizer 30 %	Deposition 66 % Manure 13 %	Deposition 20 % Manure 70 %	Deposition 44 % Manure 45%
Output 1,4 g	7,5 g	32,2 g	326 g
Erosion/ water 88 % Harvest products 11 %	Erosion/ water 79 % Harvest Products 19 %	Erosion/ water 66% Harvest Products 32 %	Erosion/ water 74 % Harvest products 21 %
+ 3,6 g per ha.a Internal flux 1 g	+ 78,8 g per ha.a 14 g	+ 237 g per ha.a 199 g	+ 896 g per ha.a 629 g



The heavy metal debate in Germany

view	main aim	measurements
Soil protection	Reduce heavy metal load	Limiting values for manure and other load materials, worst case: ban of bring out
Animal nutrition	Fullfilling the requirement in every situation	Consideration of the requirement norms, advice

→ Problems: other sources (e.g. deposition, claw bathes), ergotrophic input of Cu and Zn in feedstuff, historical soil load



Cu and Zn content of manure*

manure (slurry)	Cu mg per kg T	Zn mg per kg T
cattle	48	305
pig	531	1508
piglets	1165	1884
hen	45	430

* UBA 2004



Manure – the sink for all loads in the stables



Animal husbandry sources of Cu and Zn input

- Feedstuff - main source for Cu and Zn
- (illegal) claw bathes – high Cu input in some dairy farms
- Stable equipment – ca. 10 % of the Zn-input
- Mineral strew materials – lack of law
- Medicaments – prophylactic Zn-input for piglets



several reduction potentials



Limiting values, recommendations and requirements for pigs Cu and Zn

	Cu mg/kg T*	Zn mg/kg T
EGVO 1334/03	170 piglets 25 pigs	150
SCAN EU-scientific working group animal nutrition Proposal 2000	30 20	100
Requirement NRC,GfE norms	4-10	40-100

* Ergotropic effect from 150 – 250 mg/kg T



Potentials of reduction of Cu and Zn in manure I*

measurement	potential	practicability
reduction of supplementation pigs, poultry	+	+
dairy	0	(economical lossts) -
Cu/ZnSO4 solution for claw disinfection dairy		
a) better practice	+	+
b) ban	+	(-)
ban of Cu-, Zn in medicaments	+	?



Potentials of reduction of Cu and Zn in manure II *

measurement	potential	practicability
better Cu/Zn availability through enzymes (phytase)	-	+
better choice of Cu/Zn compounds	-	- (very difficult)
protection of Zn-corrosion in stable equipment	-	+

* KTBL 2004



The role of organic animal husbandry in the case of heavy metals - advantages

- reduction of any loads in the whole agricultural system
- high degree of integration between animal husbandry and land use (low external input)
- only requirement contents in feedstuff are aloud (no ergotrophic contents)
- very few use of claw bathes

➔ *preventive strategy - no end of pipe strategy*



The role of organic animal husbandry in the case of heavy metals

– weaknesses and tasks

- sometimes high Cu- and Zn contents in organic pig feedstuff (mineral feed)
- unknown native contents in the farm feedstuff
- Cu- and Zn-surplus in some farm cycles (pigs, poultry)
- Quality management feeding stuff has to be applied also for trace elements (e.g. certification EU legislation 223/03)
- (alternative strategies for high Cu inputs in potatoe/wine cultures)



Summary heavy metals

- 1. Organic animal farming has model character for reduction of heavy metals (not so organic wine, potatoe farming) because of the high integration degree from animal husbandry and land use**
- 2. An effective strategy minimizes the input into the farm (limiting values for manure only for monitoring)**
- 3. The main potential for reduction of Cu and Zn is the implementation of a supplementation on the requirement level completed from hygiene advice to substitute the ergotrophic input**
- 4. Claw bathes with CuSO₄ should be replaced with an holistic claw health system on the farm (cow comfort, feeding, claw care)**



Thank You!

