

Veterinary antibiotics in pig feces

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The intense livestock farming in China engenders a significant volume of manures with no other solution for farmers than land disposal. Continued land application of antibiotics-containing manure could detrimental to soil and water quality in the long term. 14 veterinary antibiotics (VAs) in pig feces were quantitatively determined using HPLC.

antibiotics	Appearance (%)	Mean value	Lowest value	Highest value	S.D.
TC	50.0	5.29	0.32	30.55	9.07
OTC	50.0	11.81	0.73	56.81	18.60
CTC	61.1	3.19	0.68	22.34	6.41
SG	22.2	0.63	0.15	1.90	0.85
SA	11.1	0.11	0.10	0.12	0.01
SMR	11.1	0.14	0.13	0.15	0.01
SMZ	27.8	1.07	0.21	2.16	0.85
SMM	27.8	1.14	0.12	4.84	2.07
SCP	16.7	0.85	0.13	2.13	1.11
NOR	27.8	1.10	0.41	3.18	1.18
CIP	27.8	0.49	0.31	0.96	0.27
ENR	44.4	0.87	0.36	2.22	0.75
DIF	5.6	0.14	0.14	0.14	0
TYL	22.2	0.69	0.23	1.88	0.80

Table 1: The residues of antibiotics in pig feces ($\text{mg}\cdot\text{kg}^{-1}$) (TC:tetracycline, OTC:oxytetracycline, CTC:chlortetracycline, SG:sulfaguanidine, SA:sulfanilamide, SMZ:sulfamethoxazole, SMM:sulfamonomethoxine, SMR:sulfamerazine, SCP:sulfachlorpyridazine, NOR:norfloxacin, CIP:ciprofloxacin, ENR:enrofloxacin, DIF:difloxacin, TYL: tylosin).

Result shows that 5.6-61.1% of four types of VAs could be detected in pig feces. The risk quotients (RQ) indicate a certain probability for adverse effects of VAs on soil microbial activity [1]. The largest RQ of OTC suggested that it should be the priority control of VAs in the study area.

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[1] Spaepen *et al.* (1997) *Environ. Toxicol. Chem.* **16**, 1977–1982.

Relationship between the longevous population and trace element in the soils of Xiayi County, China

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Effects of environment on the longevous population

Health and longevity can be considered as the product of interactions between environment, heredity and lifestyle [1, 2]. A case study on Scandinavian twins concludes that the effect of heredity on life expectancy accounts for 20–30%, whereas that of environmental change accounts for at least 70% [3]. Most recently, soil, drinking water and climate were reported to be leading environmental factors influencing regional population longevity [4]. Based on field investigation and laboratory analysis, trace elements in the soils of Xiayi County, a Chinese longevous area, were investigated, and the key elements closely linked to health and longevity were evaluated.

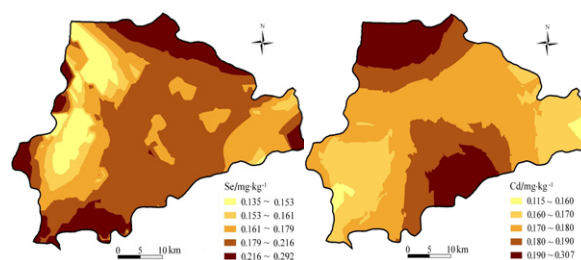


Figure 1: Spatial distribution of Se, Cd in the soil of Xiayi

Discussion of Results

The longevous population was distributed in a belt running across Xiayi County from northeast (NE) to southwest (SW). The longevity rate (number of population aged 95 or older per million) reached 83 in the NW region. Interestingly, it dramatically increased to 187 in the NE region, where the soils contained higher Se and Zn but lower Cd (Figure 1). The findings indicate that sufficient Zn and Se as well as low exposure to heavy metal pollution contribute to human longevity.

[1] Perls *et al.* (2002) *Mech. Ageing Dev.* **123**, 231–242. [2] Li *et al.* (2011) *Sci. Total Environ.* **409**, 1385–1390. [3] Ljungquist *et al.* (1998) *J. Gerontol. Ser. A, Biol. Sci. Med. Sci.* **53**, M441-M446. [4] Lv *et al.* (2011) *Arch. Gerontol Geriatr.* doi, 10.106/j.archger.2010.10.012.