Nitrogen use efficiency in global animal production systems 1970 - 2015

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Abstract

Global animal production increased considerably in the period 1970 - 2015. Global animal numbers have also increased but not as fast as animal production. Nitrogen use efficiency can be studied at three levels, namely animal level, farm level with animals, and regional level. This paper studies the effect of increased global animal production on the trend of nitrogen use efficiency.

Keywords: animal manure, grassland, meat, milk

1. Increased production per head of animal

During the period 1970 - 2015, global animal production increased considerably: meat with 220%, milk from dairy cattle 80%, and eggs with 290%. Table 1 shows the increase of animal production per category for the years 1970, 1985, 2000 and 2015. The year 1970 was taken as the reference year. Table 1 also shows the increase in global animal numbers for the same period. Table 1 learns that the increase in animal production is always higher than the increase in animal numbers. In other words, production per head of animal has always increased during this period.

Table 1. Global animal numbers and global animal production, during the period 1970 – 2015. Data are relative to the year 1970 = 100. Source: FAOSTAT.

Category	Animal numbers				Animal production			
	1970	1985	2000	2015	1970	1985	2000	2015
Meat, cattle	100	116	122	136	100	129	146	170
Meat, sheep	100	105	100	111	100	112	141	168
Meat, goat	100	129	199	265	100	157	292	433
Meat, pig	100	145	164	180	100	168	251	334
Meat, chicken	100	165	276	416	100	209	447	790
Milk, dairy cattle	100	117	119	149	100	128	136	184
Eggs, hens	100	132	201	298	100	158	263	394

2. Concept of Nitrogen Use Efficiency

Nitrogen use efficiency of animal production can be studied at three levels.

- At animal level: this includes livestock breeding, animal feed, and herd management.
- At farm level with animals: this includes grazing period, animal manure management (manure storage, use of animal manure) and animal feed production (nitrogen fertilization of grassland, leguminous plants, purchase of external feed) (Kohn et al., 1997).
- At regional level: from region, country to global scale (Bouwman et al., 2005; Van der Hoek, 2017).

3. Effect of increased animal production on Nitrogen Use Efficiency

During the first International Nitrogen Conference in 1998, a paper was presented on nitrogen efficiency in global animal production around the year 1994 (Van der Hoek, 1998). The current paper examines the effect of the considerably increased animal production in the period 1970 – 2015 on the trend of nitrogen use efficiency. Finally, measures for improvement of nitrogen use efficiency are discussed.

References

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