RIKILT
WAGENINGEN UR

Dutch research on animal manure to ensure authenticity and quality

Annemieke M. Pustjens, Piet J.L. Derikx

Background

The Netherlands is known for its high livestock density. As a result there is a (local) surplus of animal manure. Legislation on the use of animal manure and other organic and inorganic fertilizers, is put into force to ensure environmental sound use of phosphorus and nitrogen.

Objective

RIKILT is involved in several projects concerning manure:

- Quality assurance of commercial laboratories
- Investigate authenticity of manure together with the Dutch Food and Consumer Product Safety Authority (NVWA)
- Keep the analytical toolbox up-to-date

General scheme on manure analysis

From a heap or transport of manure a sample is taken (Figure 1).

Figure 1. A heap of manure (left) and a typical sample container (right).

The sample is then analysed according to the scheme depicted in Figure 2. For the quality assurance, a selection of samples analysed by the commercial labs using their own in-house method, is also analysed at RIKILT according to the reference method. Results are statistically evaluated.

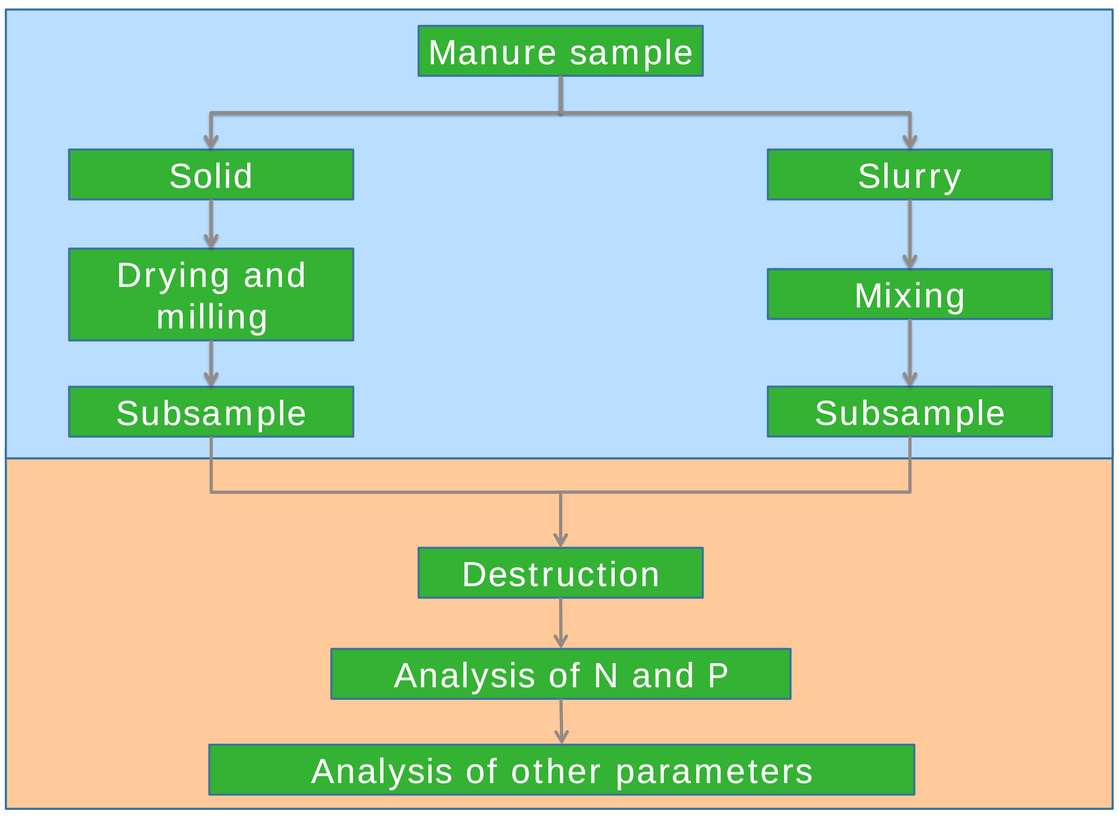

Figure 2. General scheme of manure analysis. Blue: mandatory according to national standard method; orange: according to own in-house method (commercial labs) or reference method (RIKILT).

Authenticity of animal manure

Together with the NVWA, RIKILT is active in uncovering any kind of fraud or irregularities. A wide range of analytical techniques (chemical, microbial and microscopic) is available to determine the authenticity of animal manure (Figure 3).

Figure 3. Equipment used in manure research: gas (left) and liquid (right) chromatography.

Questions that are regularly posed:

- Is inorganic fertilizer added to this sample to increase its mineral content?
- From which animal species does this sample originate?
- Is this manure sufficiently heat treated (required prior to export)?

Environmental concern of waste streams

Biogas can be produced from animal manure and other waste streams (Figure 4).

Figure 4. Biogas production from manure and waste streams.

Strict rules for the maximum allowed levels of specified contaminants in the added (waste) streams are set in national legislation, when the mixture after digestion (digestate) is applied as a fertilizer. These contaminants include heavy metals, dioxins, PCB's, pesticides and mineral oil and can be analysed by RIKILT. Also, RIKILT has developed a calculation tool to evaluate whether a waste stream complies with the legal limits.

Keep the analytical toolbox up-to-date

As the everyday practice of manure trading and transport changes permanently, a continuous effort is needed to keep the analytical toolbox up-to-date. To maintain this expertise, annually the most relevant topics are selected to develop and validate new methods for future use.

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RIKILT Wageningen UR
P.O. Box 230, 6700 AA Wageningen
Contact: annemieke.pustjens@wur.nl
T + 31 (0)317 480369
www.wageningenUR.nl/en/rikilt

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