

## 0179 - Composting of Distillery Stillage Obtained as the Waste During Bioethanol Production

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**Background:** In Poland more than 200 distillery plants produce bioethanol. Almost  $\frac{3}{4}$  of them are small and medium size with distillery stillage production between 75 to 220 m<sup>3</sup> daily. Usually these distillery plants are placed on the rural areas. That is why most of them try to use distillery stillage as a fertilizer. However, the fertilization period is rather short with exclusion of vegetation and winter periods. That is why distillery stillage has to be stored sometimes throughout several months which influences on creation of strong and very stinking odours. Also the direct application of distillery stillage with low pH (3,7-4,8) can have negative impact on properties of soils and its biological activity.

**Purpose:** The aim of this work is to develop the technology of distillery stillage composting on the organic materials windrows.

**Methods:** The experiments were carried out in laboratory and real scale. The laboratory part of research were executed with usage of 2-chamber isolated bioreactor for modelling of organic waste decomposition. The bioreactor chambers were filled in with biological material (straw, cow manure and plant wastes) and distillery stillage was applied daily with different ratios related with temperature level during thermophilic phase. The electric and electro-chemical sensors connected to data recorder and PC-computer let to control the main process parameters like temperature and gases content (NH<sub>3</sub>, O<sub>2</sub>, CO<sub>2</sub>, CH<sub>4</sub>, H<sub>2</sub>S). The physical and chemical parameters of composted mass (pH, moisture, NH<sub>4</sub>-N, N<sub>tot</sub>, C<sub>org</sub>, ash content) were analysed under the standard procedures.

**Results:** The results showed that composting of distillery stillage with mixture of organic materials can be an ecologic and economic technology of liquid waste management leading to obtain good quality compost. Water present in stillage was intensively evaporated during thermophilic phase without leakage. No CH<sub>4</sub> and H<sub>2</sub>S emission was detected.

**Discussion:** Comparing to fertilization effect of crude distillery stillage, agricultural usage of compost is more efficient and environmentally friendly. Low cost of real scale composting and possibilities of recycling other biowaste as a co-substrates in composting mixture make this technology as a good choice for food industry factories.