

## Regular analyses for the early detection of problems in the biogas fermenter

To detect possible problems in the fermentation process at an early stage, we generally recommend regularly analysing the fermenter content. This applies in particular to plants with high throughput rates or where a number of different substrates are processed. Some analyses can be carried out by the operator. For others, samples must be examined in a lab.

### Daily routine checks during operation

A number of checks should be carried on a daily basis as routine, and all results should be recorded and stored. For this purpose, it is recommended to install certain measuring equipment at the plant:

Check	Frequency
<ul style="list-style-type: none"> <li>▪ Daily feed quantity (fresh weight)</li> </ul>	daily
<ul style="list-style-type: none"> <li>▪ Gas yield or gas consumption by combined heat and power plant (must be converted to standard conditions!)</li> </ul>	daily
<ul style="list-style-type: none"> <li>▪ Gas quality (methane concentration, H<sub>2</sub>S, hydrogen)</li> </ul>	daily
<ul style="list-style-type: none"> <li>▪ With igniting jet combined heat and power plant: Fuel consumption</li> </ul>	daily

### Regular checks during operation

A number of additional measurements can be carried out directly at the plant. They don't require a lot of time and can be completed in one single sampling/measuring process:

Check	Frequency
<ul style="list-style-type: none"> <li>▪ Measurement of dry substance content of substrate (microwave, IR device, drying furnace)</li> </ul>	monthly
<ul style="list-style-type: none"> <li>▪ Buffer capacity or VOA/TAC value of fermenter content</li> </ul>	weekly
<ul style="list-style-type: none"> <li>▪ pH of fermenter content</li> </ul>	weekly

### Regular lab checks

A number of important analyses should be carried out at appropriate intervals in the lab:

Check	Frequency
<ul style="list-style-type: none"> <li>▪ VOA/TAC or buffer capacity (if this cannot be determined on site)</li> </ul>	weekly
<ul style="list-style-type: none"> <li>▪ Volatile free fatty acids (acetic acid, propionic acid, iso acids)</li> </ul>	monthly*
<ul style="list-style-type: none"> <li>▪ Total nitrogen and ammoniacal nitrogen</li> </ul>	every 6 months*
<ul style="list-style-type: none"> <li>▪ DS/ODS in fermenter content</li> </ul>	every 6 months*
<ul style="list-style-type: none"> <li>▪ (Micro) nutrients in fermenter content</li> </ul>	every 6 months*
<ul style="list-style-type: none"> <li>▪ DS/ODS in substrate</li> </ul>	monthly
<ul style="list-style-type: none"> <li>▪ Weender analysis of substrate</li> </ul>	every 6 months
* during stable production	