Application report

Moisture measurement of fish feed

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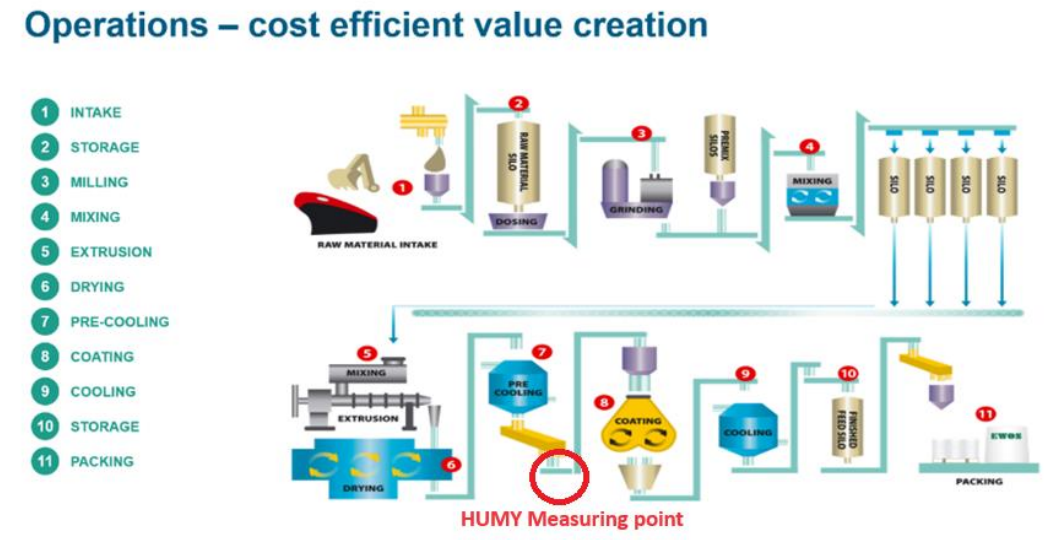
1. What is the initial situation?

- Fish in aquaculture are usually fed with granules, pellets or other forms of pressed ready-made feed. The so-called pellets are made from optimized mixtures of raw materials such as fish and/or vegetable meals and oils as well as vitamins and trace elements.
- The lining is pressed into shape (extrusion) by high pressure through a die (similar to a template) and then dried.
- The shape and size of the fish food pellets are tailored to the different fish species and their quality and consistency must be reproducible
- Initially, the pellets have a relative moisture content of 25 - 27%, this must be reduced to 11% (in order to have a high calorific value)
- For this purpose, the pellets are dried after pressing
- As a rule, the product moisture is measured in the laboratory after drying in order to achieve a constantly high moisture content and calorific value of the feed and to minimize the energy consumption of the dryer to what is necessary
- Without real-time measurement, however, the moisture values are not available until late, so production may be outside the specification



Process in fish feed production

2. Solution

- Inline moisture measurement of the fish feed after the pelleting process (usually between cooling and coating)
- Product selection via the PLC interface or a digital input is provided.

3. What needs to be considered during planning and implementation?

- Use process questionnaire
- If possible, take a photo or video of the measuring point and send it in with the questionnaire for clarification
- Plan the application precisely and discuss it with the customer.
- Clarify where and how calibration can be carried out (is sampling possible near the sensor? Calibration with at least two different humidity values possible? Calibration of the sensor at the same time as sampling, evaluate at least three laboratory samples per measuring point)

a) **Measurement in the hopper:**

- A good measuring location is in the middle of the lower part of a hopper, as this provides the best coverage with the product and a constant product movement.

The measurement is located in the lower part of the hopper

b) **Measurement in a screw conveyor**:

- The sensor is installed in a screw conveyor by approx. 20° in the direction of rotation
- Installation at the bottom of the screw conveyor should be avoided, as the screw helix is approx. 2 cm from the bottom, the material does not move there or is not constant
- Ensure sufficient loading of the screw conveyor and thus constant material coverage of the moisture sensor
- Calibration time should be approx. 30-60 seconds
- Filter time for measured value output at least 30 seconds

c) **Further information**:

- It is recommended to lay a 4-wire cable (shielded) from the RS485 interface of the Humy transmitter to the control room or laboratory (where measurement samples are taken or measured values are displayed)
- A laptop or PC can then be connected via RS485 - USB converter to configure the sensor and save measured values (Humy 301 only)
- The sensor must always be calibrated in the process (no static calibration on samples outside the measuring point)

4. Customer benefits:

- High consistency of the end product, always the same calorific value
- Continuous process monitoring, no overdrying, less energy consumption

5. What restrictions exist:

- No special restrictions

6. Why our solution is the best:

- Robust measuring system with few failures
- High accuracy, no drifting of the measurement results

7. References

- Cargill, Norway

If you have any questions or concerns, please do not hesitate to contact us!

Mütec Instruments GmbH
At the Kämpen 26
D-21220 Seevetal-Ramelsloh
Germany

Tel.: + 49 (0)4185-8083-0
Fax: + 49 (0)4185-8083-80
Mail:muetec@muetec.de
Web: www.muetec-instruments.de

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