

Pig Stable Treatment with QM-BioStable & MicroCat-DL



Customer: EuroPig S.A. (Sergiana Group)

Location: Sercaia, Romania

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- ▶ Farm size: 22 hectare with >50.000 pigs/year, 32 stables
- ▶ Test Setup:
 - ▶ 2 Identical stables in respect of:
 - ▶ Climate conditions
 - ▶ Surface (4 compartments of 25 x 18 m per stable)
 - ▶ Number of animals
 - ▶ Control Stable: 2206
 - ▶ Test Stable: 2205
 - ▶ Animal weight at start of pilot: 27 - 28 Kg
 - ▶ Animal weight at end of cycle: 100 - 110 Kg



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Treatment Objectives

- ▶ Increasing the living comfort of the livestock, increasing the food conversion and decreasing stress by decreasing the concentration of ammonia (NH_3) and hydrogen sulphide (H_2S) in the environment.
- ▶ Manure liquefaction and maintaining a homogeneous condition (semi-liquid state), preventing sedimentation of solids and avoiding the clogging of the discharge channels.

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Application Program

BioStable application to achieve objective 1

- ▶ Dose: 0,5 L QM-BioStable per compartment/week (2 L/Stable/week)
- ▶ Diluted in sufficient amount of water and manually sprayed on the surface

MicroCat-DL application to achieve objective 2

- ▶ 3 Phase application
 - ▶ At start before stables are populated 11,3 Kg MicroCat-DL/Stable added to the basement under the floor ($V_{\text{manure}} \approx 540 \text{ m}^3$)
 - ▶ After 30 days: 22,6 Kg MicroCat-DL
 - ▶ After 60 days: 50% removal of manure and dosing 11,3 Kg MicroCat-DL ($V_{\text{manure}} \approx 720 \text{ m}^3$)

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Monitoring Program

- ▶ Ammonia (NH₃) using Dräger Pac 7000 manual monitors
- ▶ Hydrogen Sulphide (H₂S) using Dräger Pac 3500 manual monitors
- ▶ Physical and chemical analyses of manure by a Renar (Romanian National certification Agency) accredited laboratory
- ▶ Microbiological analyses by the National Sanitary Veterinary Institution in Romania
- ▶ Economical analysis

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Ammonia & Hydrogen Sulphide gas monitoring in the stables

- ▶ Ammonia (NH₃) concentrations during the pilot period
 - ▶ Control Stable: NH₃ levels structurally around 50 - 60 ppm
 - ▶ Test Stable: NH₃ levels <25 ppm
- ▶ Hydrogen Sulphide (H₂S) concentrations during the pilot period
 - ▶ Control Stable: ≤ 1,2 ppm
 - ▶ Test Stable: ≤ 0,6 ppm (only once recorded)
- ▶ General observation was that in the test stable the animals were more active and curious.

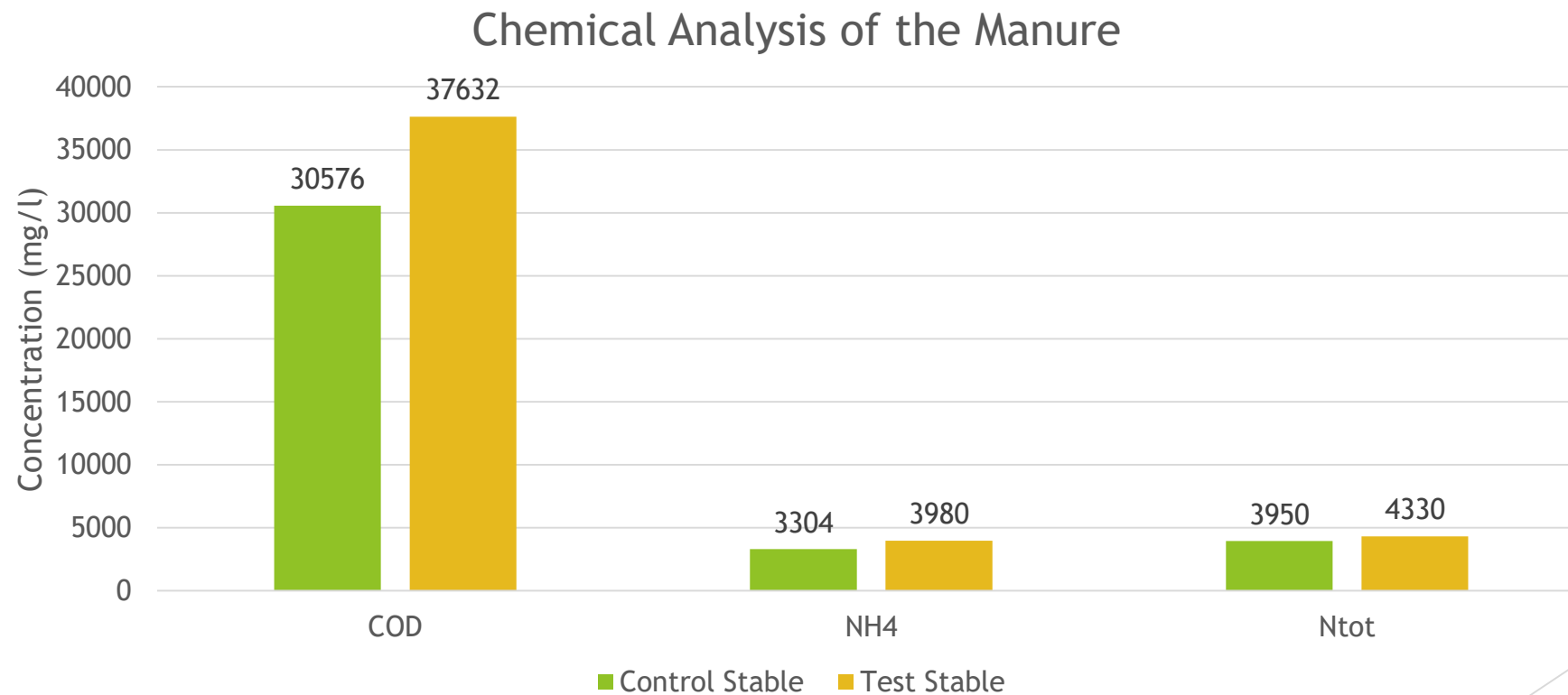


Control Stable NH₃ & H₂S monitoring



Test Stable NH₃ & H₂S monitoring

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A petri dish containing a yellowish bacterial culture on a solid medium. There is a small, distinct red spot in the upper center of the dish, likely representing a specific bacterial strain or a point of interest in the culture.

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Microbial Analysis

- ▶ *Salmonella Spp.* - Absent
- ▶ *Listeria monocytogenes* - Absent
- ▶ *Staphylococcus cp* - Absent
- ▶ *Clostridium perfringens* - Absent
- ▶ *Escherichia coli** - **Present**
- ▶ *Coagulase-negative Staphylococcus* - Present
- ▶ *Intestinal Enterocoli* - Present

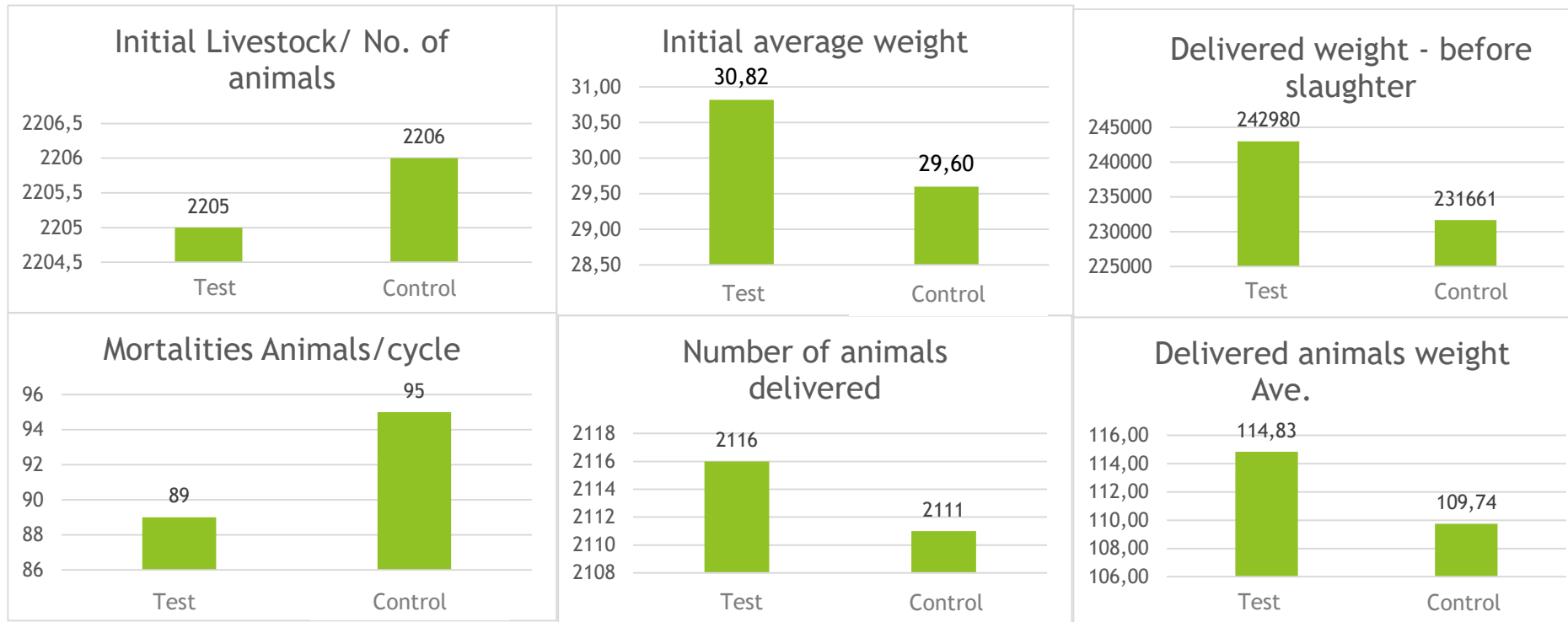
Conclusion

- ▶ No dangerous bacteria for humans or animals where detected

* Many species of E.Coli are harmless, the ones detected do not form a hazard

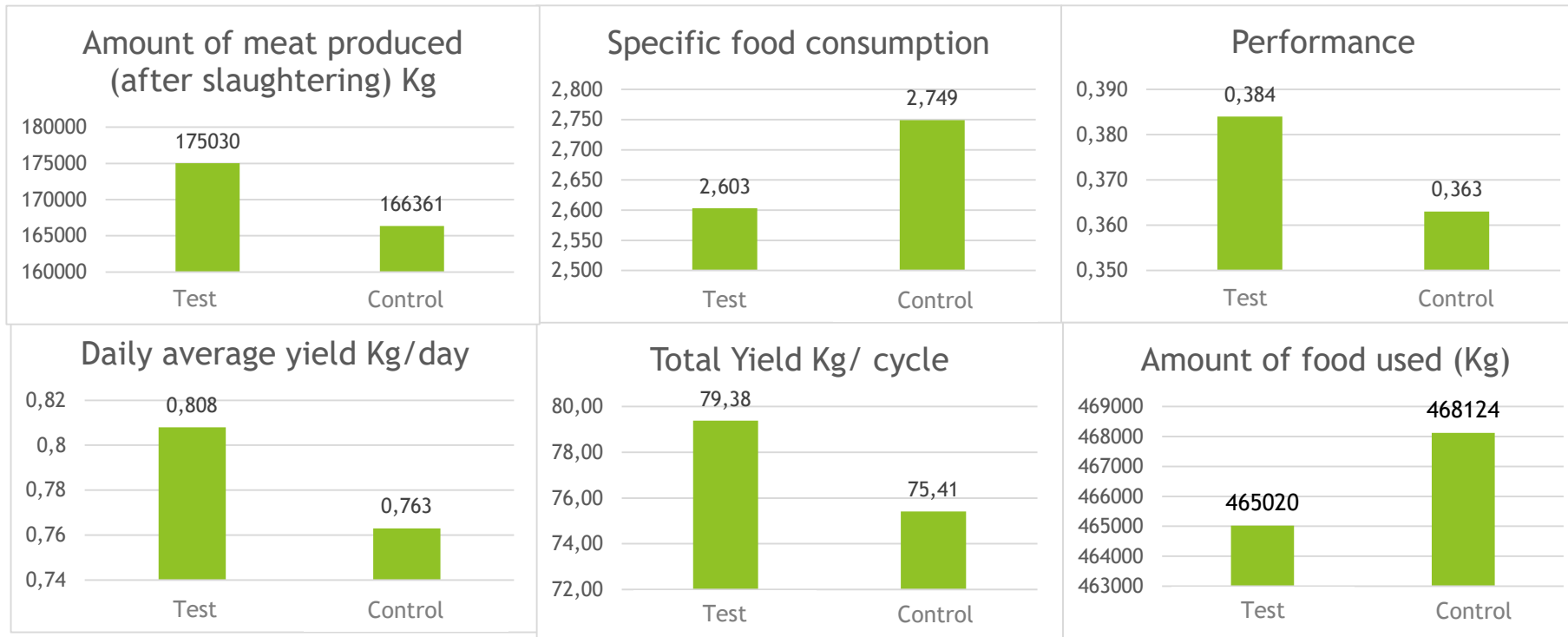
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Economic Analysis



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Visual observations

- ▶ Manure
 - ▶ Visual inspection of the manure demonstrated that the manure remained in a homogeneous condition. Sedimentation was prevented and the coarse part separated much better on the existing parabolic screens.
 - ▶ The easier transport of the manure out of the manure basement underneath the stable reduces times needed for cleaning in between production cycles.
- ▶ Animals
 - ▶ The animals in the treated stable showed more activity in comparison to the animals in the control stable.
- ▶ Visual inspection of the respiratory tract after slaughter
 - ▶ The respiratory tract systems of the animals were inspected by the veterinarian after slaughter. The respiratory tract of the animals in the treated stable were clean and pink of colour. No lacerations were visible. The respiratory tract of the animals in the control stable showed irritation and lacerations.

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Conclusions

- ▶ Ammonia concentrations remained below 25 ppm during the complete test period in the test stable. Ammonia levels in the control stable were 2x higher.
- ▶ Hydrogen sulphide levels were non-detectable during most of the monitoring events in the test stable. Only once it was detected at 0,6 ppm. The control stable showed H₂S levels as high as 1,2 ppm.
- ▶ The application of QM-BioStable significantly improved the air quality inside the treated stable reducing the negative effects associated with ammonia and hydrogen sulphide for the animals.
- ▶ The manure from the treated stable was considerable easier to pump than the manure from the control stable. This reduced the time for clean out.
- ▶ Chemical analysis of the manure demonstrates the effects of QM-BioStable and MicroCat-DL in respect of the level of mineralisation and locking nitrogen inside the manure rather evaporation to the atmosphere.

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Conclusions

- ▶ Microbial analysis showed the absence of pathogenic bacteria in the test stable.
- ▶ During the test 26 Litre QM-BioStable and 45,2 Kg MicroCat-DL were consumed
- ▶ This equates to an average investment of € 2,07/head
- ▶ Mortality in the treated stable was 6 % less than in the control stable
- ▶ The test stable produced 8.669 Kg (4,95%) more meat after slaughter
- ▶ The animals in the test stable consumed 3.104 Kg less food than the animals in the control stable.
- ▶ The food conversion ratio (FCR) in the test stable was 2,66 against 2,81 in the control stable

Pig Manure Treatment with QM-BioStable & MicroCat-DL

Easy to apply & Safe to use without danger to animals and workers

Reduces solidification of manure in basements, pits and depots

Reduces turnaround time in stables between breeding cycles

Improves air quality inside stable

Improves living conditions for the live stock →
Easier compliance with EU Directive 98/58/EC
(Annex Clause 10 in respect of gas concentrations)

Healthier live stock reduces mortality and increases animal weight

Healthier live stock reduces the requirement for medicine like antibiotics

Reduces the food conversion ratio → Less food needed to achieve target weight

Increases the final yield for the farmer

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