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Lehr- und Forschungszentrum  
Landwirtschaft  
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# Agricultural Research and Education Centre Raumberg-Gumpenstein



Ministry for agriculture and forestry –  
environment and water management

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# LFZ Raumberg-Gumpenstein

- **Research and Teaching/Education**
- **330 qualified employees (210 for research / 120 for education)**
- **Actual about 100 research projects**
- **450 pupils** in the education sectors, **agrarian marketing** and **agrarian management**; usually 5 years schooling  
3 years **build-up course**; school boarding house; school leaving exam general qualification for university entrance
- **Locations for Research in Irdning (main), Wels, Lambach, Piber, Winklhof, Admont and Kobenz**





# 4 Research Institutes

1. Institute of Livestock Research

2. Institute of Plant Production and Cultural Landscape

3. Institute of Animal Welfare and Animal Health

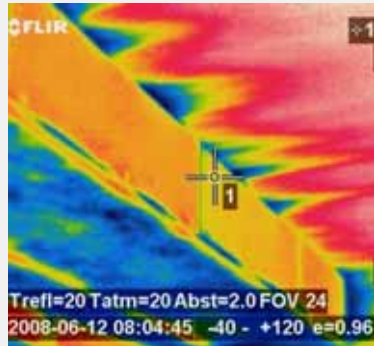
4. Institute of Organic Farming and Farm Animal Biodiversity

A vertical diagram on the left side of the slide showing five levels of stress: 'No Stress' (green), 'Mild Stress' (yellow), 'Distressed' (orange), 'Severe Stress' (red), and 'Fatal' (dark red). The diagram is overlaid on a grid and a large, faint circular graphic in the background.

# Institute of Farm Animal Welfare and Animal Health

Dr. Johann Gasteiner (ECBHM)

- Animal Husbandry and Animal Welfare
- Stable Climate, Emissions, Noise
- Agricultural Engineering
- Economy and Resource Management
- Animal Health



# Dep. Stable Climate and Animal Welfare

Eduard Zentner

- Investigation of climate in stables
- Development and evaluation of ventilation techniques
- Evaluation of emissions and problems caused by stables
- Olfactometric analysis of odor emissions caused by animal husbandry
- Measurement and evaluation of noise emissions (since 2008)
- Dealing with questions concerning licensing of stables – writing certificates and reports, process up to 9 years!!

# Detection of stable climate defekts

- Using measuring instruments, smoke machines, thermal imaging cameras, gas measurement technology – Dräger Xam 7000 especially ammonia and carbon dioxide
- Impact on animal health
- Impact on (tenfold) emissions



dedekt



impact



improvement



# Evaluation of ventilation techniques

- e.g. Testing of low noise fans for Ziehl Abegg - Germany
- FE 2 Owllet fan with a central ventilation system
- Noise measurement <35dbA, required by law in OÖ
- note Pollution – dust, energy, etc.



# Dealing with questions concerning licensing or permission of stables

- Big problems with neighbors from stables
- both in cattle, pigs and poultry
- Very small stables within 5 stables per farm
- and very large stables (1500 sows, 40000 hens)
- that is absolutely the minority (2%)





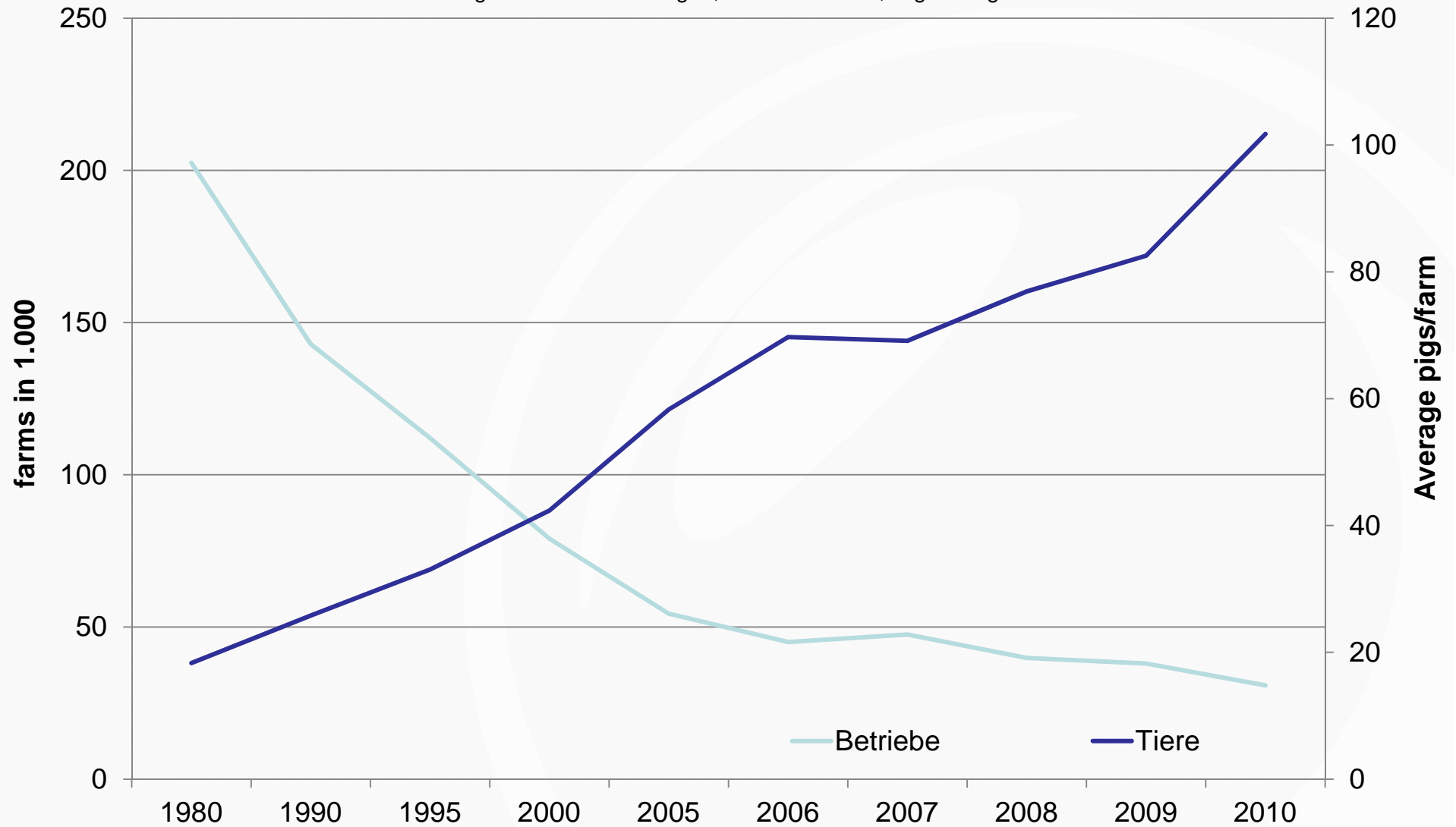
# Livestock Breeding in Austria

- 2 Mio. cattle, 800.000 dairy cows, av. milk yield 5,700 l
- Cattle: 16 animals per farm, 55 % of farmers have secondary activities (avocation)
- 3.2 Mio pigs



# Pig farms in Austria

Quelle: Allgemeine Viehzählungen, Statistik Austria, Ergänzung BMLFUW aus L048.



# Idea or strategy by the BMLFUW

- Exhaust cleaning systems are considered but too expensive for our structures
- so we`re looking for possibilities to reduce the emissions
- reduce in the stable – by the animals
- to get a better animal health and performance
  - Stable climate = working climate



# Trials and studies

- We were starting 2005 in Gumpenstein with two climate chambers
- Odor measurement with Mannebeck Olfactometer TO8
- Gas measurement with 3 Dräger Multigassampller Xam 7000 for permanent measurement
  - 1 Xam in each chamber, comparison and control with the third Xam
- Since 2010 gas measurement with the multipoint sampler Innova 1309 and monitoring by Innova 1412
- Ammonia, carbon dioxide, nitrous oxide and methan



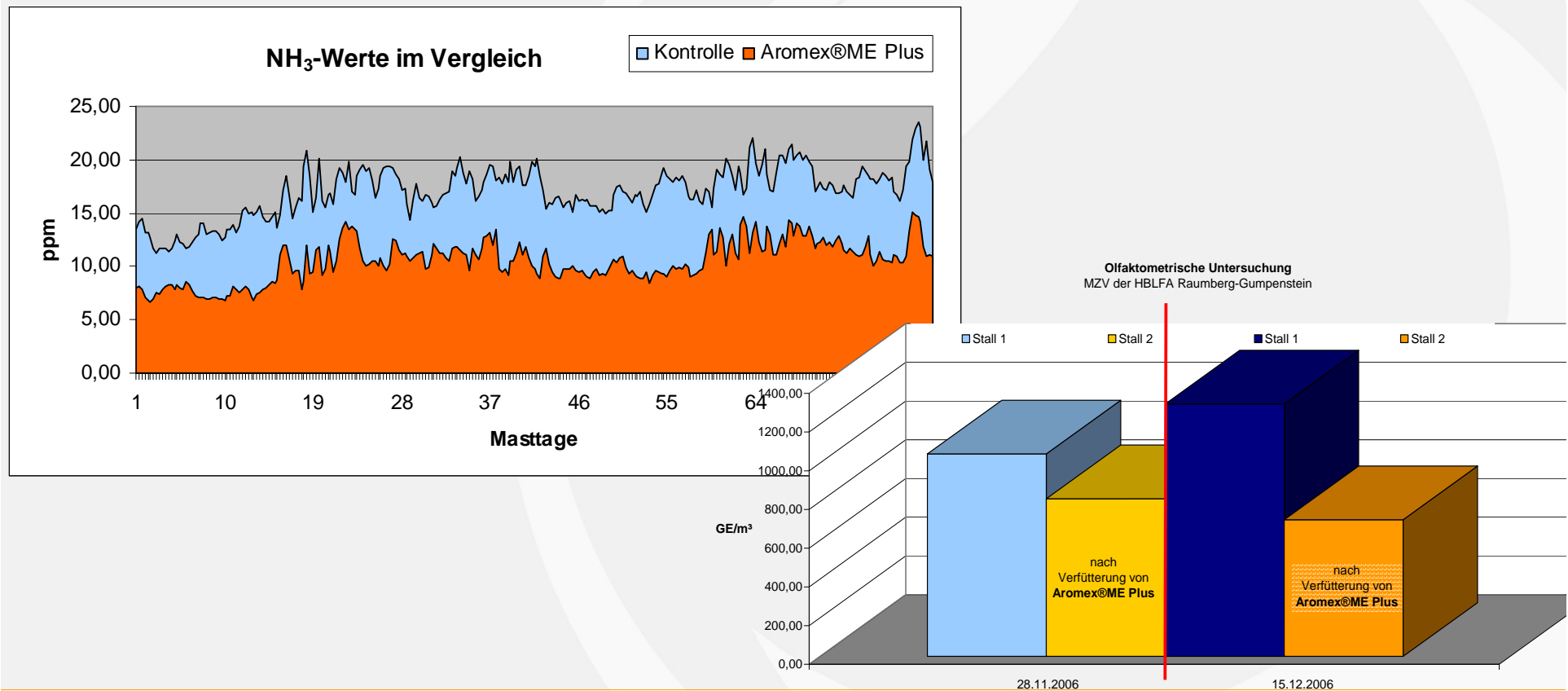
## Effects 2005 to 2012

- Positive and negative effects - 50 : 50 since 2005
- A lot of strange and marvelous things in circulation on our farms, whether they are improved or verified
- e.g. negative effect in trial on a stable air cleaning system, very bad smell and odor
  - „Hydroxyl ozone generator“



# First positive effects

- 2007 – feed additive Aromex ME+ by Delacon
  - Reduce ammonia and odor by about 30%



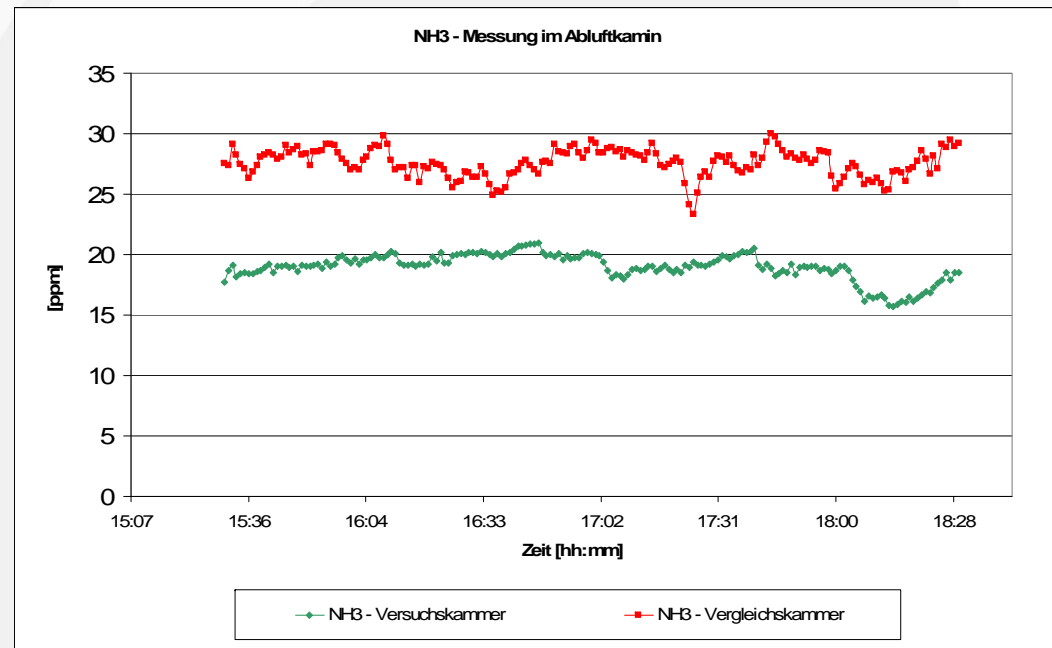
# Effects 2008

- feed additive RIWA + with negative or no effects
  - No reduction on ammonia and odor
- No further cooperations with some companys! What an experience!
- Some Companies changed their name!?



# Effects 2008

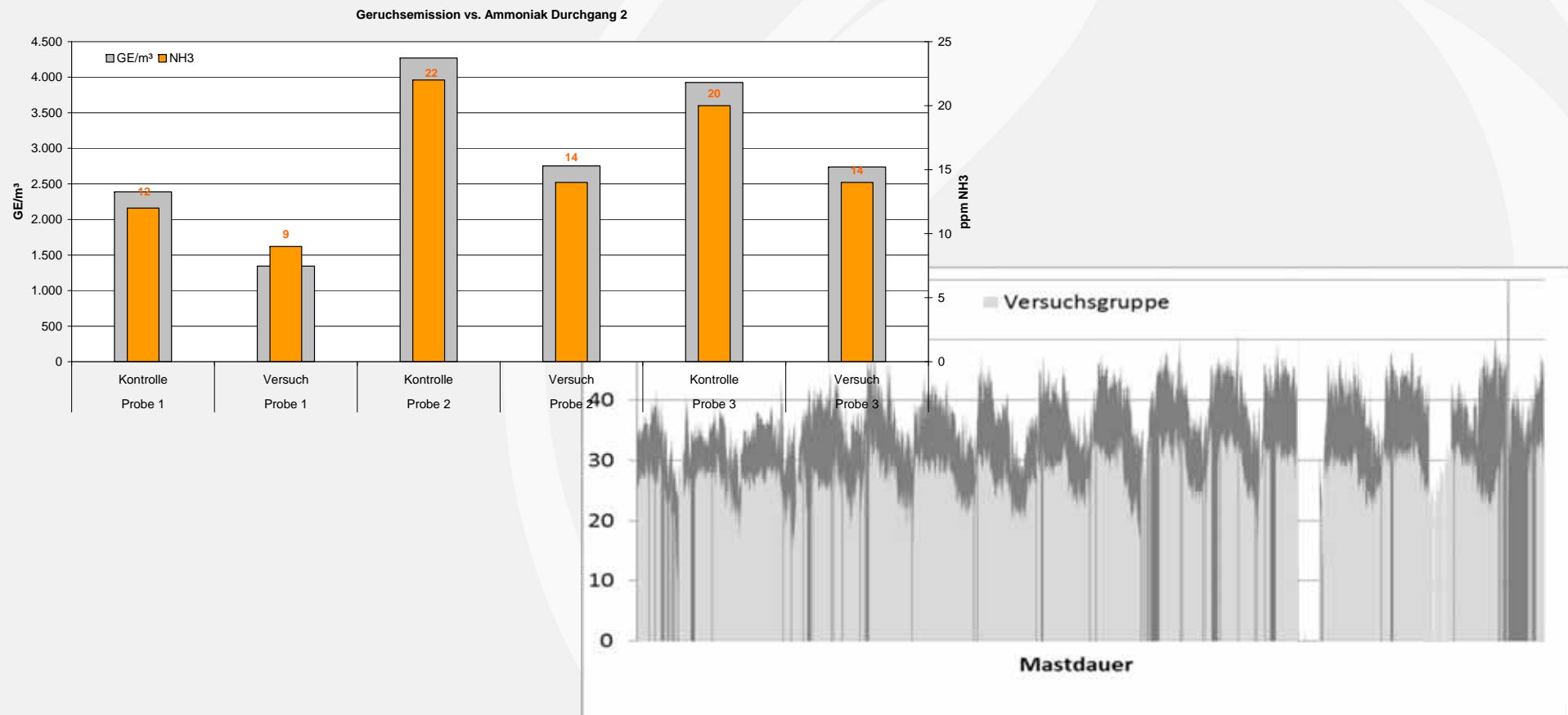
- Spraying system with water and eucalyptus oil by Buchrucker, Company in OÖ
  - Negative effect on odor
  - Reduce ammonia by about 30%





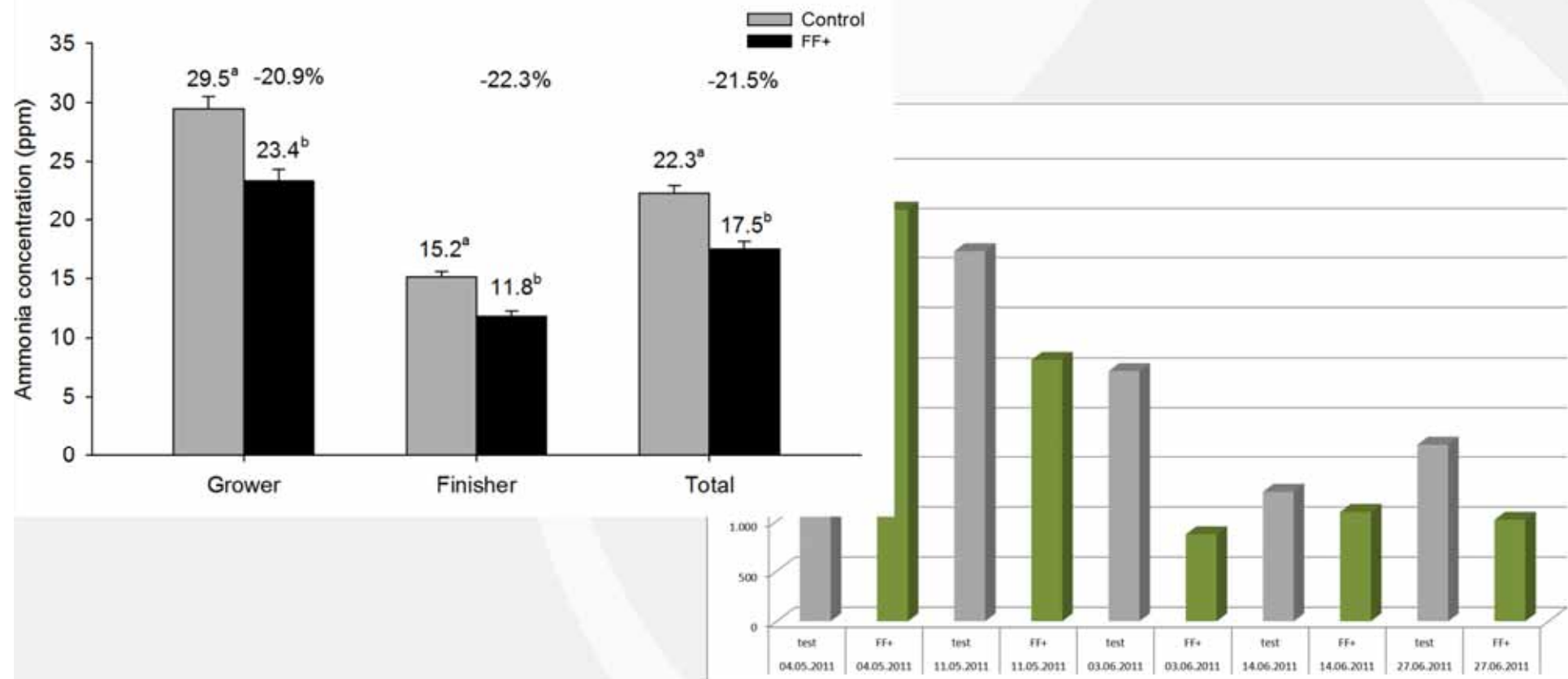
# Ergebnisse 2009

- Feed additive APC nat. add. 0,2 – Gleisdorf
  - Reduce ammonia and odor by about 30%



# Ergebnisse 2010

- Feed additive Fresta F+ by Delacon
  - Reduce ammonia with 25% and odor by about 30%



# Zusammenfassung

- Negative and positive effects in the pig trials
- There is a positive effect to reduce odor and ammonia in the stables – that's what we need in Austria!
- We converted the trial chambers in summer 2011 for studies with poultry
- Why? We need data of the ingredients of solid manure for the fertilizer management – law in Austria
- and as in the pig trials, we're looking for effects to reduce ammonia and odor in the Austrian stables!
- as in the pig trials, we've positive and negative effects!
  - They're not published until now!





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