

Managing PCVAD and other Health Issues

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Health Protection Concepts

- **High Health Status through exclusion**
 - Economically important diseases
 - loss of productivity
 - Unacceptable mortality/morbidity
 - Reduced feed efficiency
 - Difficult to manage agents
 - Agents with useless or no available vaccine
 - Rapidly changing agents (RNA viruses)
 - FAD's

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Health Protection Concepts

- **Exclusion requires:**
 - Functional Biosecurity strategies
 - Known status of replacements
 - Health status of semen/boars
 - Control of all segments of production
 - Isolation
 - Monitoring
 - Lots of dollars \$\$\$\$\$

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Health Protection Concepts

- **Disease Control rather than exclusion**
 - Accepts agents as endemic and unavoidable
 - Control is based on:
 - Internal biosecurity
 - Sanitation
 - Disease resistant genotypes (F-18 E.coli)
 - Efficacious vaccines
 - Controlled exposure (feedback, mixing, acclimatization)
 - All-in, all-out
 - Multi-site production
 - Parity Segregation

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Health Protection Concepts

- **Disease Control rather than exclusion**
 - Often less expensive to implement
 - Productivity is often compromised
 - Logically it is a balance:
 - Cost of Exclusion \neq Cost of control + lost productivity
 - Soft issues (welfare, morale)
 - Management competence

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Health Protection Concepts

- Generally we use both concepts
 - Exclusion of the most costly when possible
 - Manage the others
- Both methods can be costly
- Both often fail to meet expectations

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Cost Effective Vaccine use?

- What vaccines hope to accomplish
 - Reduce the effect of specific diseases
 - Lower mortality and morbidity
 - Provide some protection against outbreaks
 - May provide some protection against new disease introductions (Insurance)
 - Animal vaccines are generally safe



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Cost Effective Vaccine use?

- What vaccines don't accomplish
 - They don't eradicate disease
 - They often don't prevent disease - only severity
 - Many times they are totally ineffective
 - Many times they are not cost effective
 - They are a not part of an external biosecurity program



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Quantizing Risk

- Biosecurity should be based on a set of economic choices that:
 1. Properly rank the risk factors
 2. Properly rank interventions
 3. Recognize the cost/difficulty of specific interventions



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Quantizing Risk

4. Accurately measure the value created by exclusion of targeted agents
5. Recognize that many risk factors are interrelated
6. Recognize other even less tangible risks may not be known



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Biosecurity Philosophy

- Biosecurity is expensive
 - Transport \$55 - \$85/trailer
 - Shower system ~\$5/employee/day
 - Boar Stud monitoring ~ \$.80/dose
 - Isolated multiplication - ?
 - Isolation facility/monitoring ~ \$15/gilt
 - Insects and Rodents - ?
 - Training - ?
 - Filters - ?



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Biosecurity Philosophy

- Your Farm - Your System
 - Define and designate key people and their roles
 - Empower people at all critical control points
 - Sell the plan



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Biosecurity Ranking the Risk

- Proper prioritization of controllable factors
 - Science based
 - Understand the inherent system/farm weakness -
 - "Location"
 - Allocate resources - big risk to small



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Biosecurity

- Implement
- Implement
- Implement
- Monitor



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Influenza Control

- Vaccine is a +/-
- People play a role in transmission
- Biosecurity methods may not be effective
- Best to match vaccine strains to circulating strains
- Untreated surface water may be an issue



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PRRS Control

- Cross protection has been the largest issue with vaccine
- Area spread is still a mystery
- Finishing pigs are the usual reservoir
- Biosecurity can be effective but not always
- Airborne spread is a winter event
- Pig transport vehicles
- Biosecurity mistakes



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Managing Herd Health?

- Living with PRRSv has not been easy
- Eradication is easy but keeping it out difficult
- PRRSv has been the main road block to Maximizing Piglet performance



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PCVAD





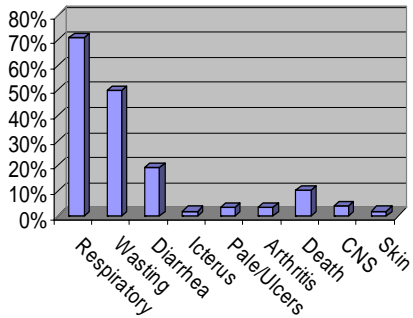
PCV2 Associated Disease (PCVAD)

- First identified in Canada 1991
- Reported in 1996/97/98 - US and Canada
- France and Spain in 1997
- No clear case definition in the US
 - Diagnosis was based on pathology reports
 - Recently the AASV developed a specific case description



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Clinical Signs of PCVAD



PCVAD

- PCV-2 virus has been declared the causative agent by most investigators - global
- Canada and the US have reported significant outbreaks beginning 2004/05.



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US & CANADIAN EXPERIENCE

- Why this sudden change?
 - The virus has been in most pigs for many years
 - New more virulent strains?
 - A new more elusive agent?
 - Changes in genetics?
 - Changes in management?
 - Changes in the PCV2 virulence factors?



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The US Experience

- Mostly endemic/mild form until recently
 - Occasional pigs with PMWS/PDNS
 - Usually nursery pigs associated with Hps, PRRS, & Flu
- Epidemics have become more common
 - NC, IA, KS, MN, IN, IL, AZ, OH, NB, All pig producing states



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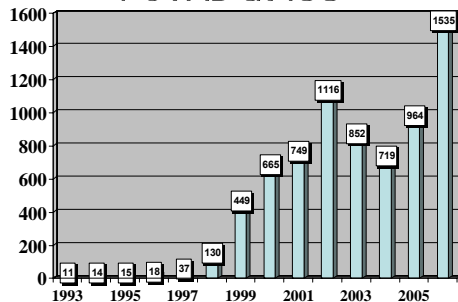
The Recent US Experience

- High Mortality
 - Often affected and unaffected in same pens and barns
 - Affected die - Unaffected perform well
 - > 50% barn mortality is not uncommon
 - Outbreaks last 4-6 weeks
 - Usually start second to 3rd week post placement
 - Deaths rates high by week 3
 - Taper of to destroyed by week 6/7



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Trends in total cases of PCVAD at ISU

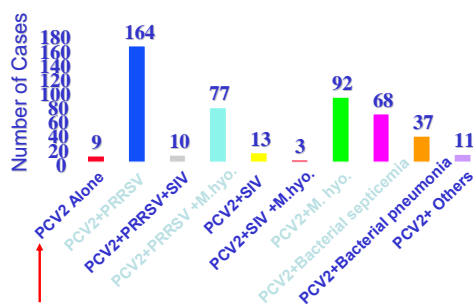


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Trends in PCVAD diagnosed at ISU VDL

	2000	2001	2002	2003	2004	2005	2006 (August)
Pneumonia	404	379	557	407	346	383	581
Systemic Disease	258	349	529	462	337	522	859
Enteritis	2	11	25	23	21	26	47
Abortion	1	10	9	3	2	2	5
PDNS	7	8	12	7	16	23	43
Total Histopath Cases	5455	6397	6913	5866	5713	6715	5776

PCV2 co-infections in 484 U.S. field cases: ISU-VDL



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PCVAD Finisher Mortality

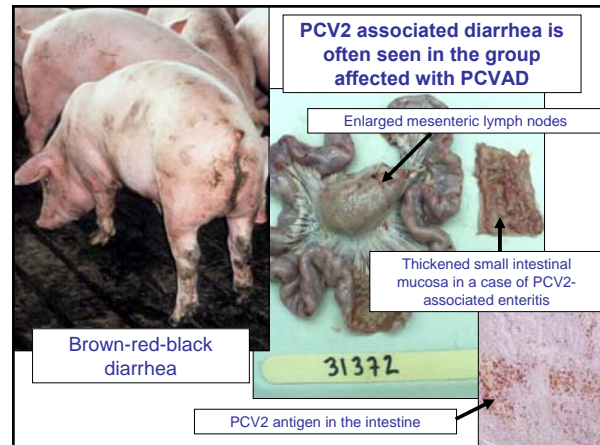
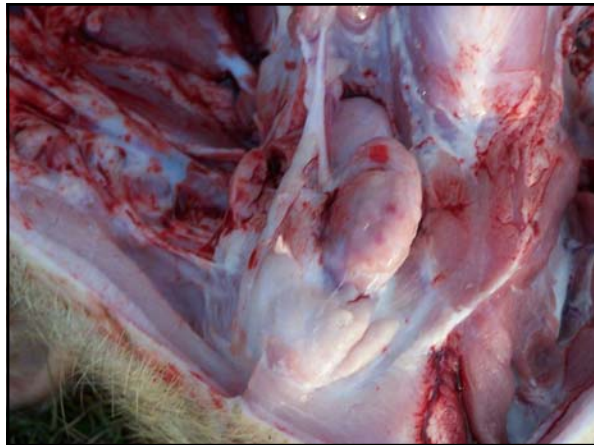
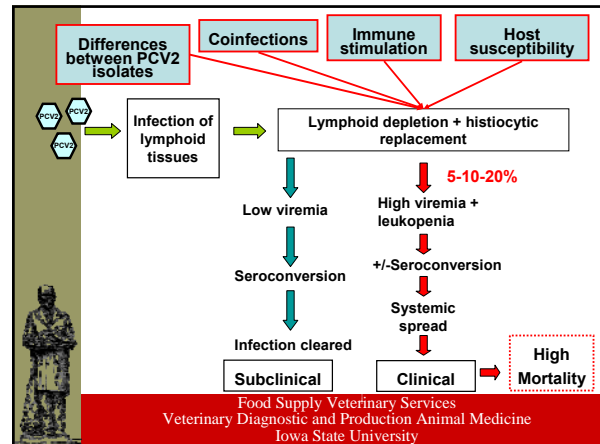
- No clear indication of other agents
 - PRRSv most frequent co-agent
- No FAD's
- Pigs do not respond to antimicrobial treatment – bacterial agents are unlikely co-factors



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What we Know Today

- PCV2 isolates that are genetically highly homologous may differ in virulence – study and field supported
- Immune stimulation is associated with PCVAD
- There appears to be pig genetic susceptibility
- Most high mortality cases have European like isolates
- Virus is very stable and resistant to heat and disinfection (120°C)
- Easily tracked across continents?
- It may be in semen if recently a infected boar
- Other opportunities?

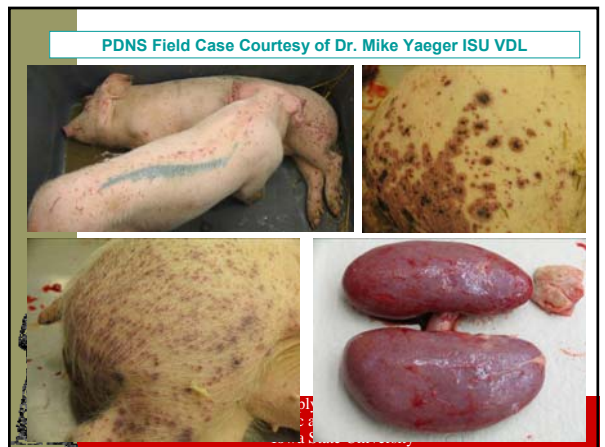
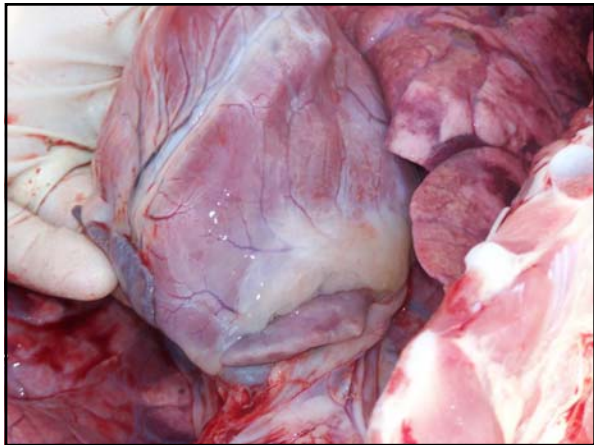
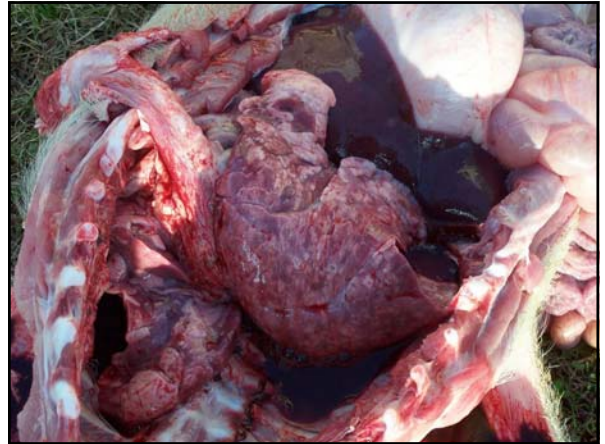


Mesocolonic edema is increasingly recognized in grow-finish pigs



Interlobular edema is increasingly reported in grow-finish pigs





Control of PCVAD – Efforts that appeared beneficial

1) Husbandry

- Strict AIAO
- Minimize fostering
- Minimize physiologic stress
- Minimize co-mingling
- Sanitation
- Dry, warm, and comfortable
- Etc.



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2) Control other diseases :

- The most important strategy
- Complete and accurate diagnostics
- Strategic use of antimicrobials???
- PRRS
 - Avoid seroconversion in early finisher
- Mycoplasma
- Flu
- Others ???????



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3) Vaccination and immune stimulation:

- Role of other vaccines as cofactors?
 - Literature – Appears necessary for PCVAD
 - Field experience – Yes – No – Unknown
- Oil based adjuvant vaccines
- Timing of vaccinations may be important
 - At least 2 weeks prior to PCV2 infection



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4) Genetic:

- Controversial topic
- Pat and Tonya reported - Landrace
- Pietrain or Hampshire effect
- Never forget male and female
- Canadian experience
 - Definitely an effect
 - LW vs Duroc: 3% vs 8.5%
 - Pietrain vs Duroc: 5% vs 9.5%
 - Duroc vs Duroc – distinct line differences



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5) Commercial vaccine:

- Sow vaccine:
 - Merial vaccine in Europe now Canada
 - Interesting improvement – 1 million sows
 - First vaccinated April 2006
- Piglet vaccine:
 - Fort Dodge
 - Intervet
 - BIVI



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• “Homemade” tissue vaccine has become popular

- Due to commercial shortage
- Inexpensive to make
- Probably not killed
- Highly controversial
- May be illegal?
- Ethics? Food safety?



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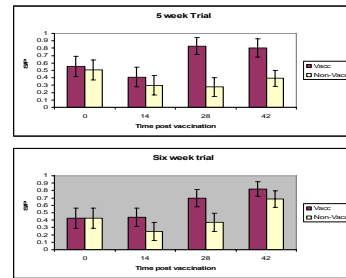
PCVAD CONTROL

- It has been Difficult without an understanding of the cause/risk factors
 - Vaccines are available but supply still does not meet demand
 - Field Reports indicate very good results



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Early vaccine trial



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Conclusions

- Multi-factorial
- Still many mysteries
 - Risk factors and agents?
- Science is still incomplete
- Vaccine looks very promising
- **"Not everything that counts can be counted, and not everything that can be counted counts."**
<Einstein>



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