Swine production research: How to implement and extract value

Matt Allerson, DVM, PhD

Holden Farms, Inc.

About myself….

- DVM: University of Minnesota

- PhD: University of Minnesota – Influenza A virus epidemiology

- Holden Farms, Inc. (Northfield, MN, USA)
  - Veterinarian and research lead (2009-current)
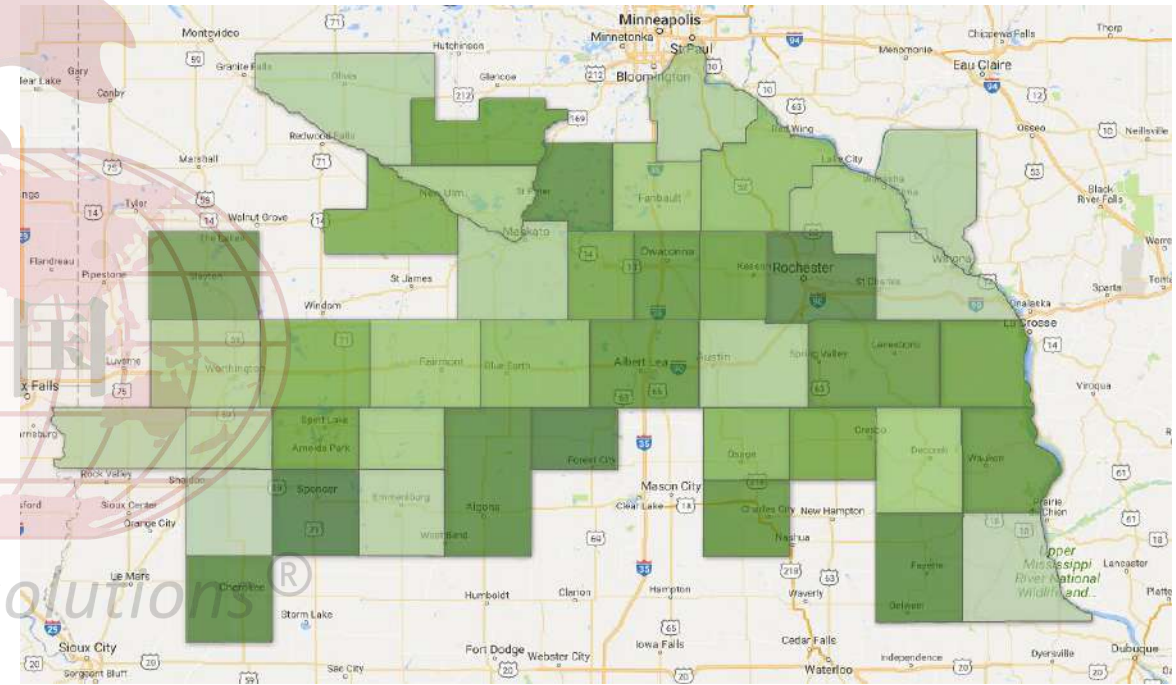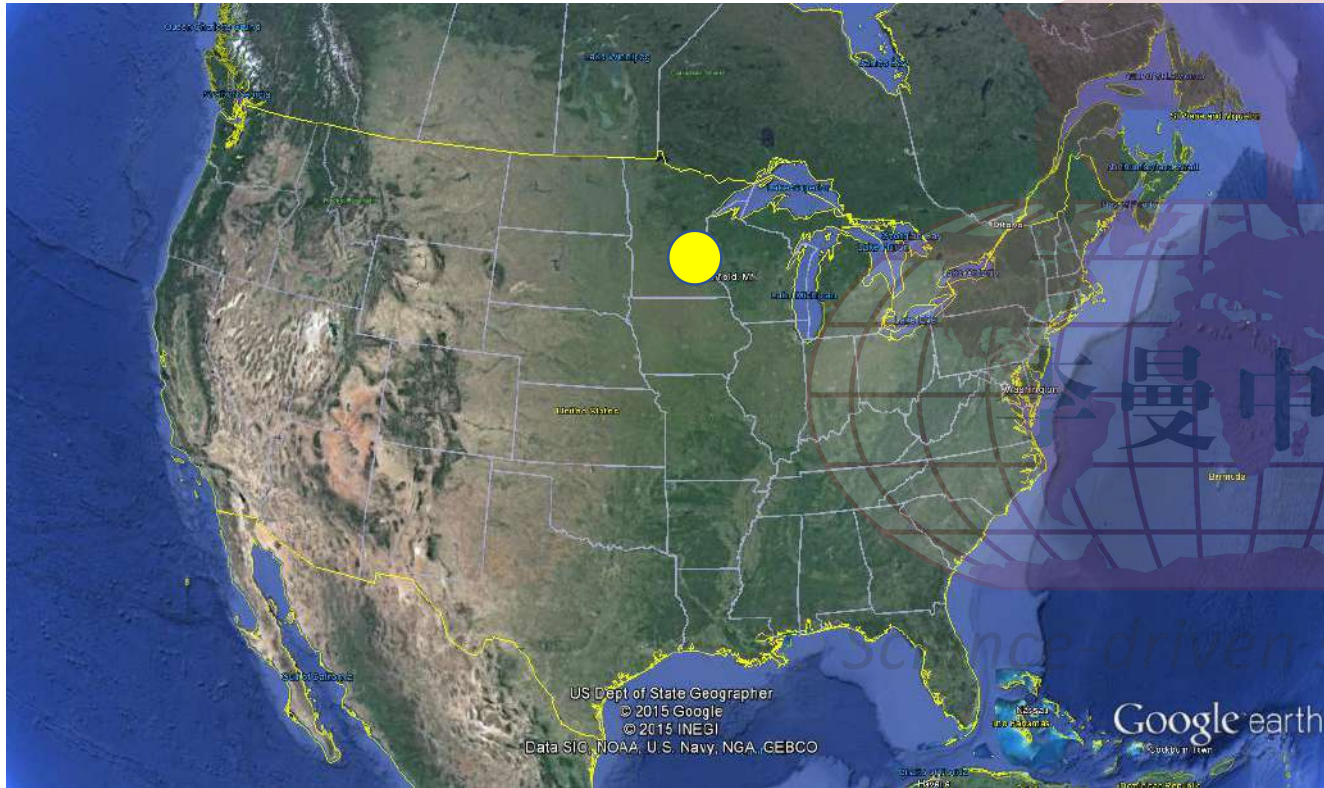
Science-driven solutions®
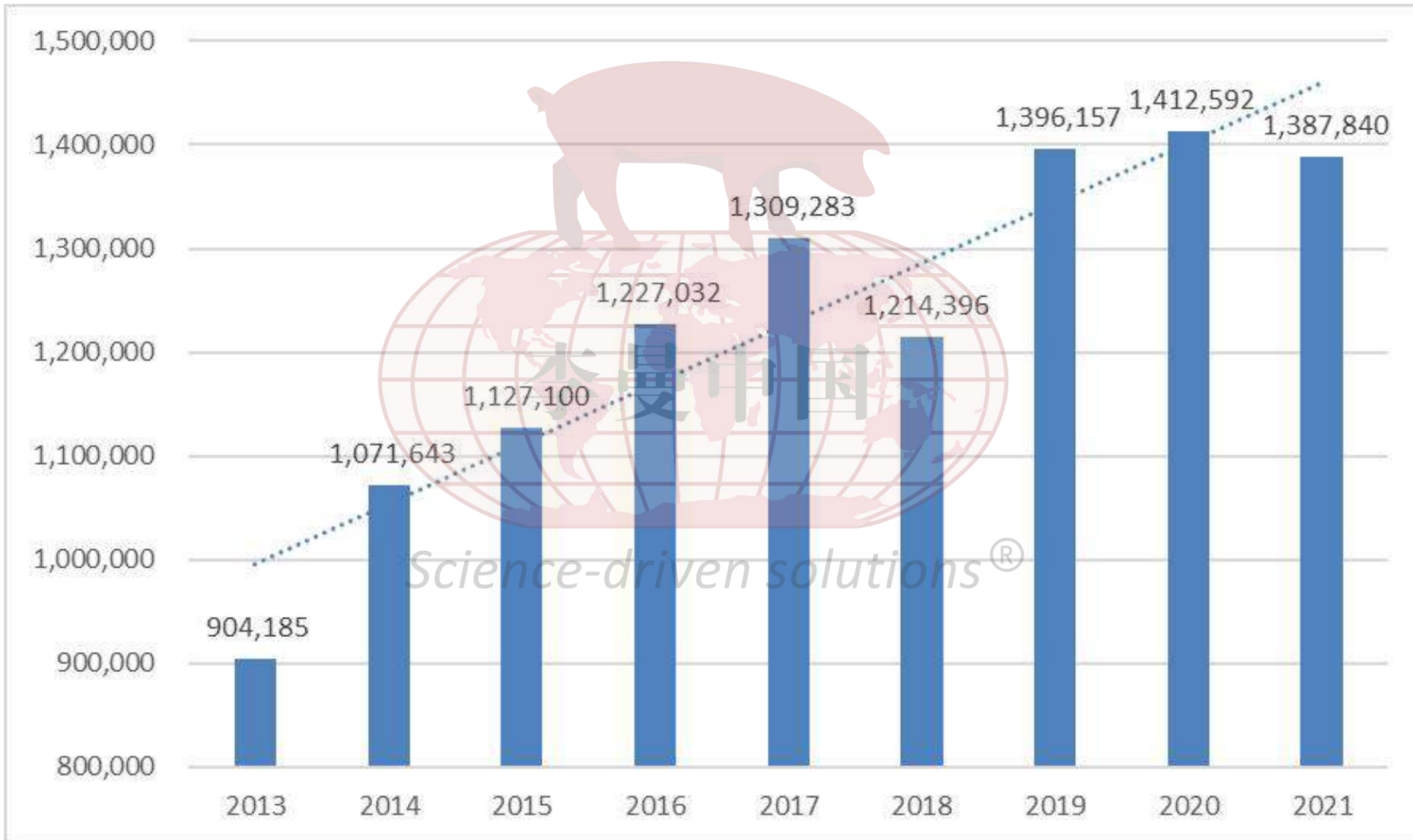
Holden Farms today

- Based in Northfield, MN, USA

- 100% Family Owned
  - 5th Generation

- Primary focus is the hog division
  - Sell ~1.7 million hogs/year
  - Also sell ~500,000 turkeys/year
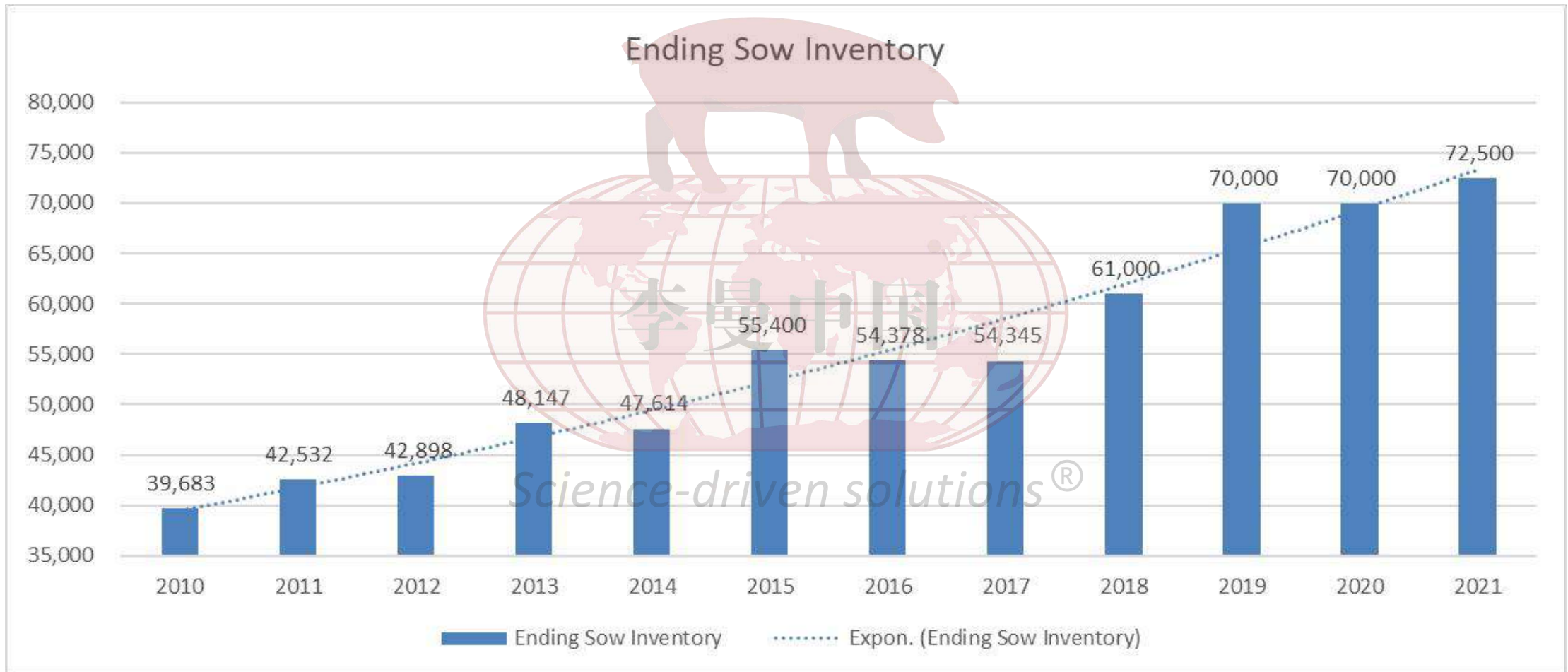 - Half owner of Daisyfield Packing in Sandusky, Ohio ~ 800,000 hogs/year

Holden Farms territory/area

Market hogs - Sales growth

Sow inventory

Ending Sow Inventory

Commitment to outside learning/research

Research – why does HFI invest in research?

- To make evidence based decisions within the HFI system
  - Economics, performance
  - Similar barn, HFI pigs, feed, etc.
  - Allows for timely implementation of system specific ideas/trials
  - Since Mid-1990's
    - ~200 nursery trials
    - ~100 finishing trials
- What types of trials do we conduct?
  - Feed trials
  - Genetic trials
  - Management trials
  - Health, vaccine, medication

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HOLDEN farms

Facility design – what is required?

- **Ability to weigh each pen of pigs**
  - Weight
  - Average daily gain

- **Ability to track the amount of feed used per pen**
  - Feed intake
  - Feed conversion

- **Ability to track pigs removed**
  - Removal and mortality %
  - Treatment %

- **Carcass/plant level data?**
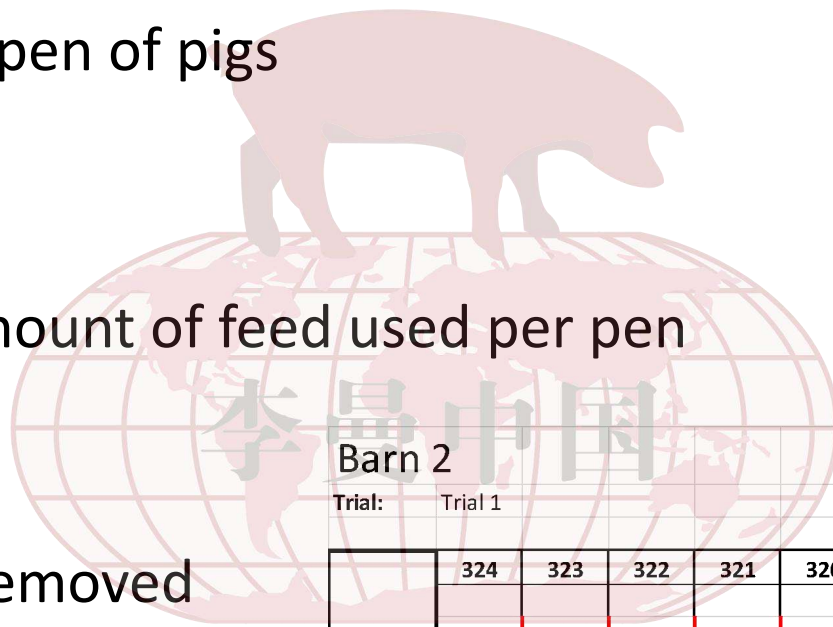
Barn 2

Trial: Trial 1

Scale	324	323	322	321	320	319	318	317	316	315	314	313	312	311

Holding	424	423	422	421	420	419	418	417	416	415	414	413	412	411

-2,400 head wean to finish research site
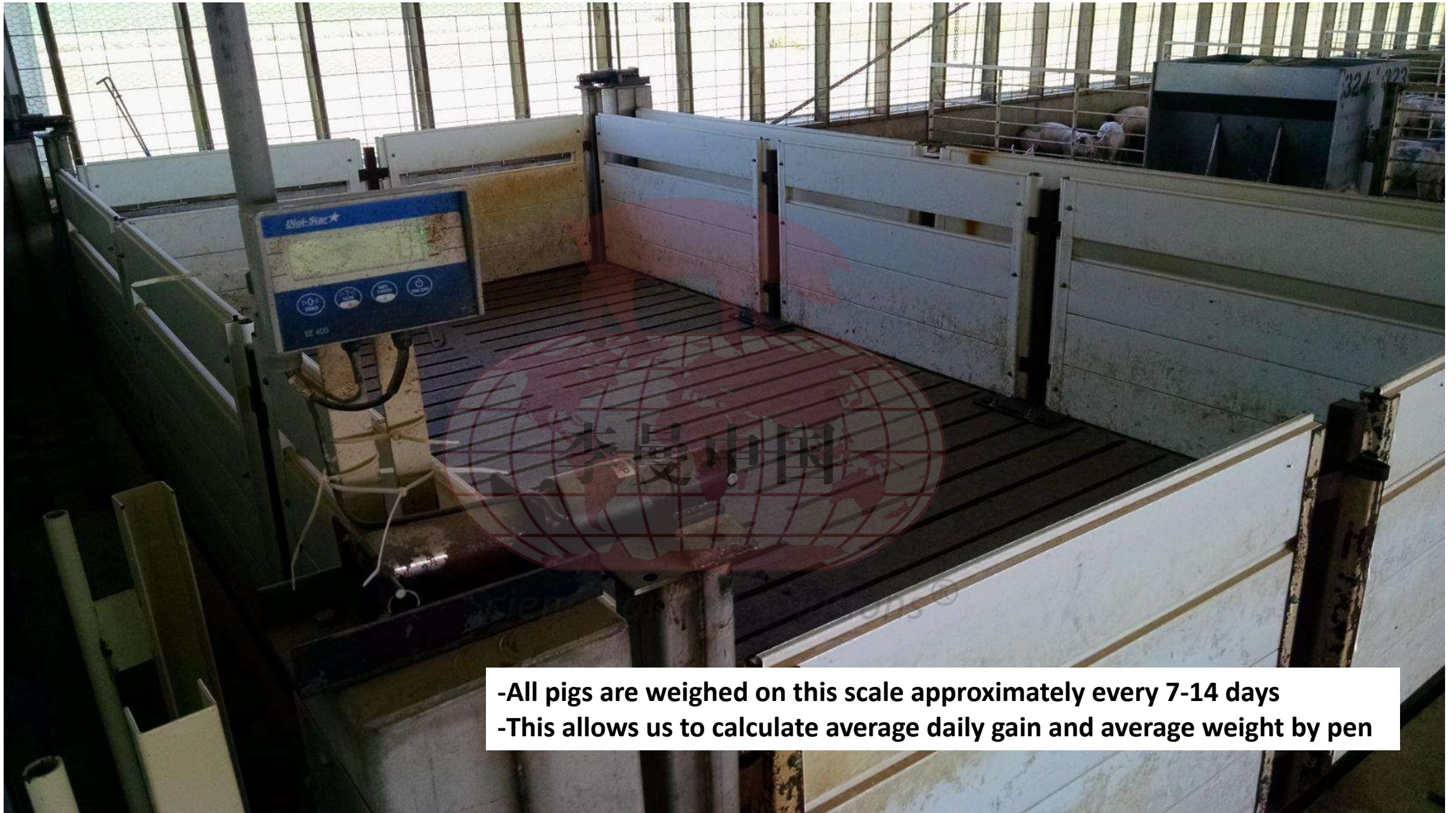
-Shower in/out facility
-8 feed bins per room

-96 pens of 25 pigs that can be used for research
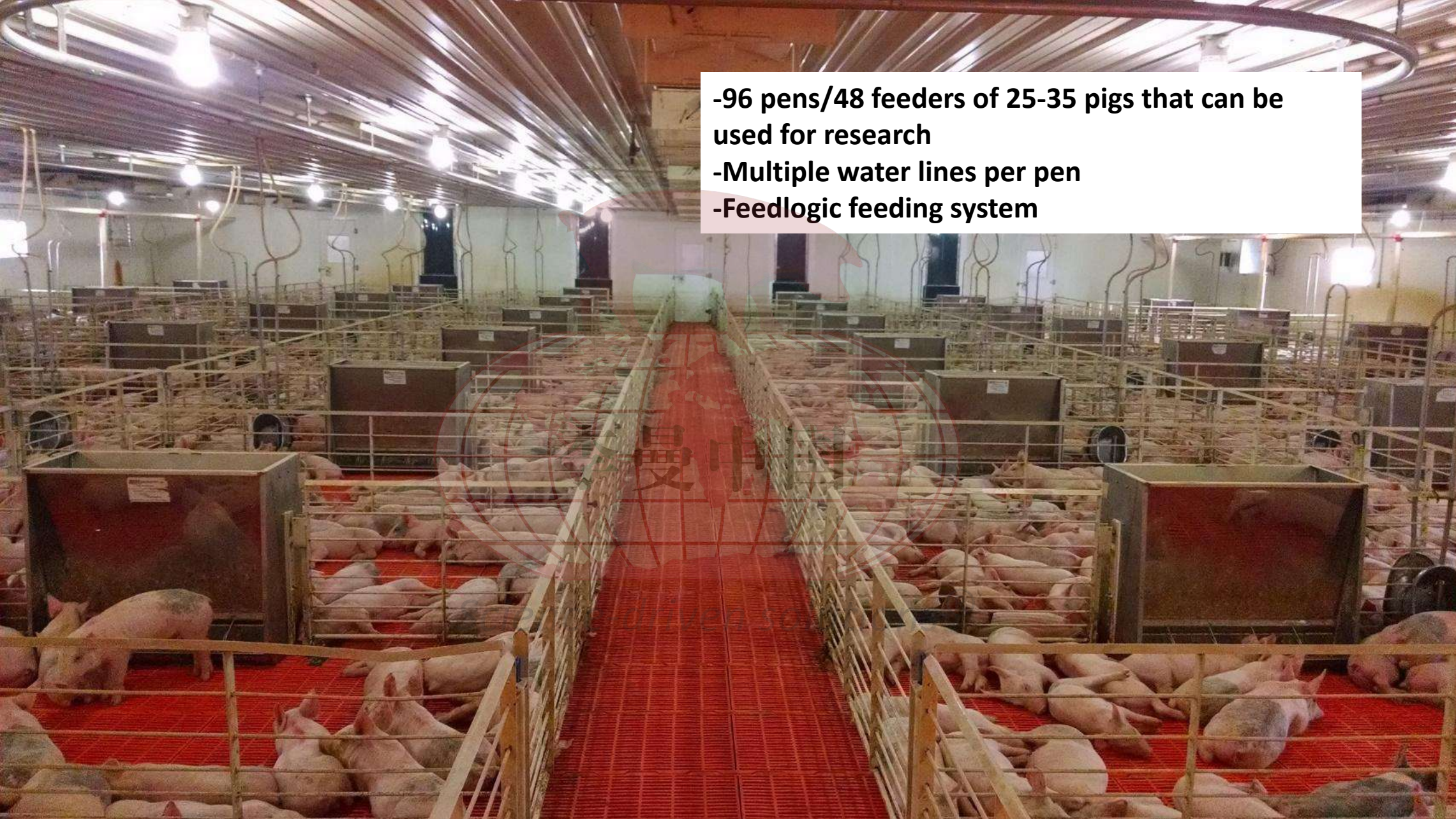-Adjustable gating (space trials/removals)
-6 water lines per pen

-All pens are fed using FeedLogic technology
-This allows us to calculate feed conversion/intake by pen

-All pigs are weighed on this scale approximately every 7-14 days
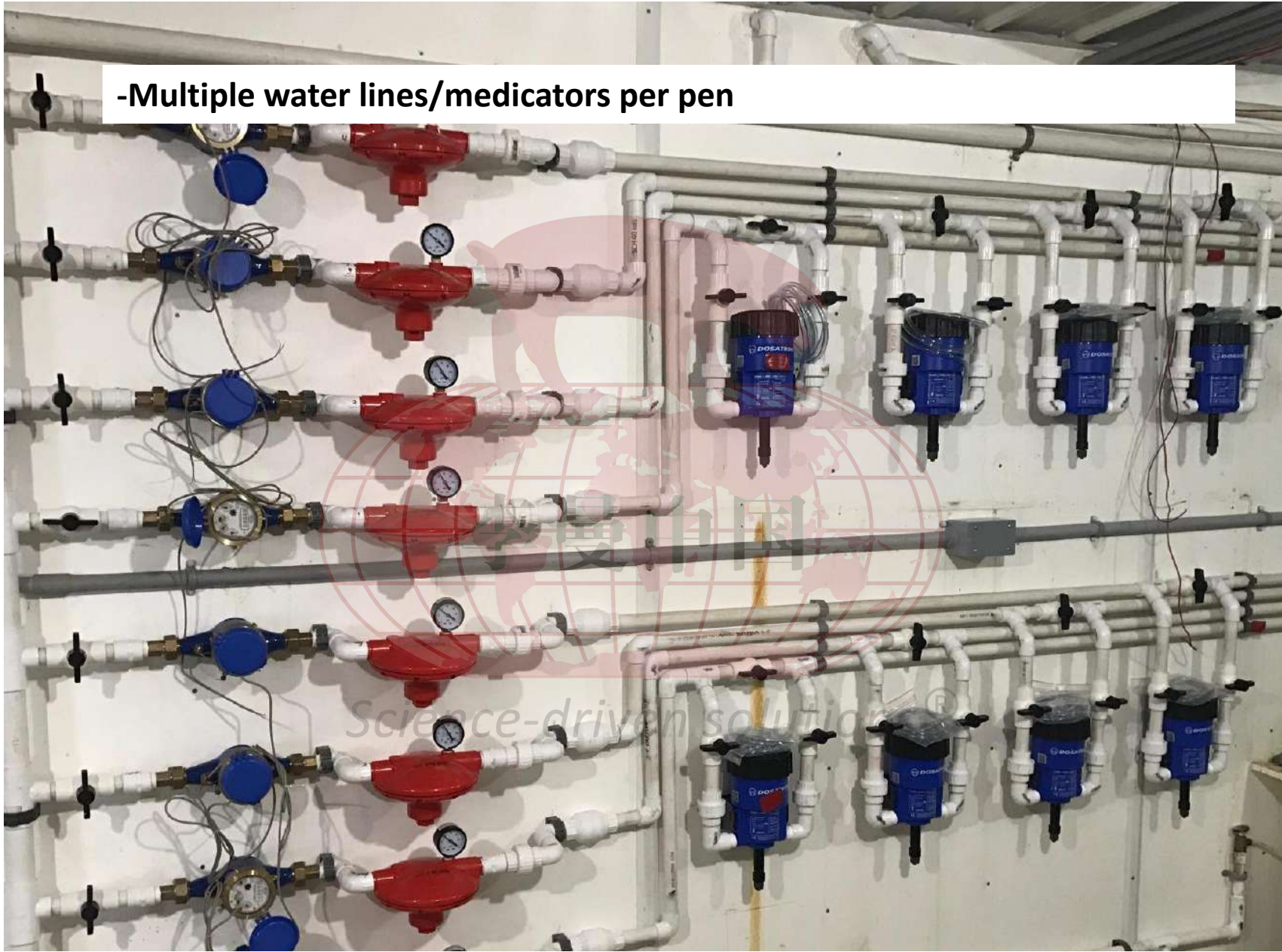-This allows us to calculate average daily gain and average weight by pen

4,000 head research nursery

-96 pens/48 feeders of 25-35 pigs that can be used for research
-Multiple water lines per pen
-Feedlogic feeding system

-Multiple water lines/medicators per pen

Which trials do you conduct?

1. Potential value to the system
   - Economic return

2. Ability to implement in a system
   - Can it actually be accomplished system wide?

3. System specific issues that cannot be answered otherwise
   - Health (specific vaccines or medications)

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Who is involved in the decision making?

1. Production (sow and nursery/grow-finish)

2. Veterinary

3. Nutrition

4. Leadership team (economics, future company direction)

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Major areas of trials conducted

1. Feed/nutrition
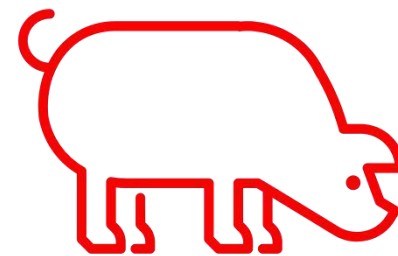2. Genetics
3. Health, vaccine, medication
4. Management
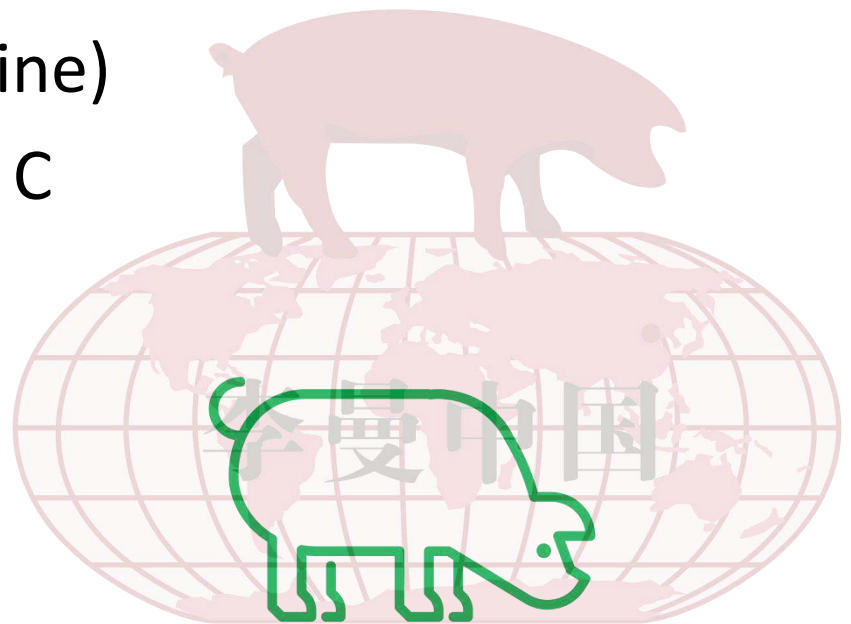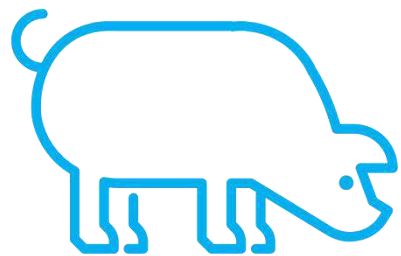
Trial example

- Genetic trial (sire line)
- Sire line A vs. B vs. C

Trial example

- **What are the treatments?**
  - Sire line (A, B, C)

- **What are the outcomes of interest?**
  - Pig weight
  - Average daily gain
  - Average daily feed intake
  - Feed conversion
  - Mortality %
  - Removal %
  - Carcass characteristics
    - Yield, backfat, etc.

Trial example - Planning

- Sow farm
  - Breeding protocol for sire lines
  - Breeding timeline to match opening in the wean to finish site
- Other considerations
  - Balance EBV/CBV across sire lines
  - Balance sow parity across sire lines
  - Balance breeding dates by sire line (birth/wean age)
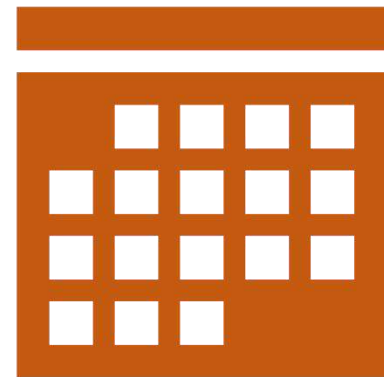
Trial example - Identification

- Identification
  - Ear tag or other identifier to confirm treatment group at birth (sire line)
    - Individual ID helps to track other variables
      - Sow parity
      - Birth date
      - Wean age

Trial example – site placement

- Control for other variables known to affect your outcomes of interest
  - Wean age
  - Barrow/gilt/boar
  - Space allowance
  - Area of the barn
 - Feeder space
  - Water type
  - Medications
  - Diet

Trial example – Data collection

- Determine your period and frequency of data collection
  - Weekly to bi-weekly until marketing
- Data collection
  - Pen weight
  - Pen count
  - Feed delivered to each pen
  - Feed remaining in each feeder
  - Removals
  - Mortality
- Validate all data soon after data collection

Trial example – Data analysis

- Determine the type of analysis needed
  - Varies based on the trial type/design

- What is biologically significant to the system?

- What is economically significant to the system?

- Economic simulations
  - High market price, low feed cost
  - Low market price, high feed cost
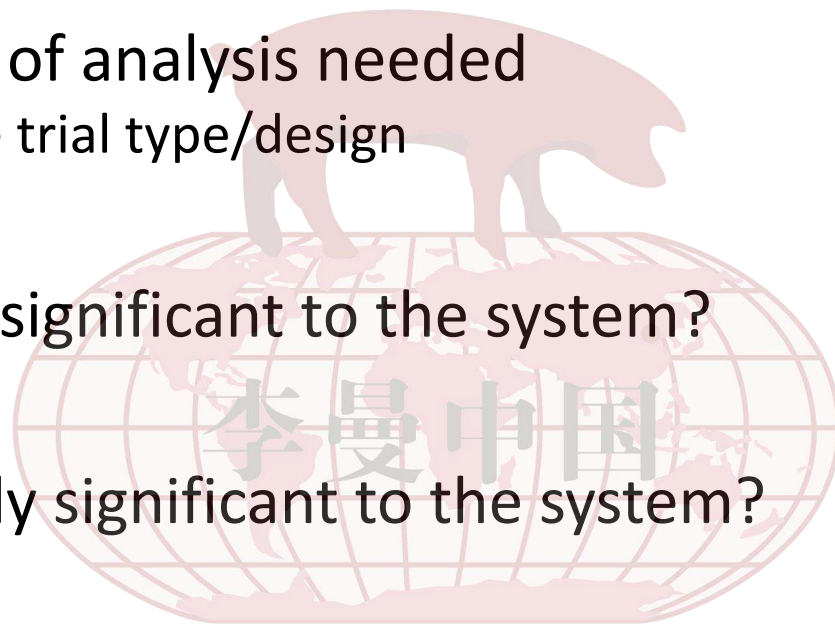
Example - Results

Treatment (sire line)	A	B	C
Average of weight P0	12.74	10.94	12.47
Average of wt P14	307.7	298.9	306.9
Average of ADG P014	1.77	1.73	1.79
Average of ADF P014	4.18	4.09	4.21
Average of FG P014	2.36	2.36	2.36
Average of Total removals %	16.9%	16.9%	9.9%
Average of Mortality %	2.7%	2.6%	3.3%
Average of Removals %	14.2%	14.3%	6.6%
Average of feed cost/pig	$78.07	$74.02	$82.80
Average of revenue/pig	$125.06	$121.24	$135.08
Average of IOFC/pig	$46.98	$47.22	$52.27

Summary

- Production research farms and teams can provide timely answers to system specific questions

- Economic value can be realized in different ways
  - Not using an ineffective product (cost savings)
  - Production improvement (increased IOFC)

- Understand your systems opportunities and needs

- Provide the best barn set-up and invest in people to help