

Reproductive Biology of an Introduced Wild Pig Population over Four Decades

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Wild Pig Reproductive Biology

- Have a very high reproductive potential
- Studied
 - Number of locations
 - Short time frame (1-2 years)
- Inconsistent results
- Some data lacking



Wild Pig Reproductive Biology

Purpose of Study

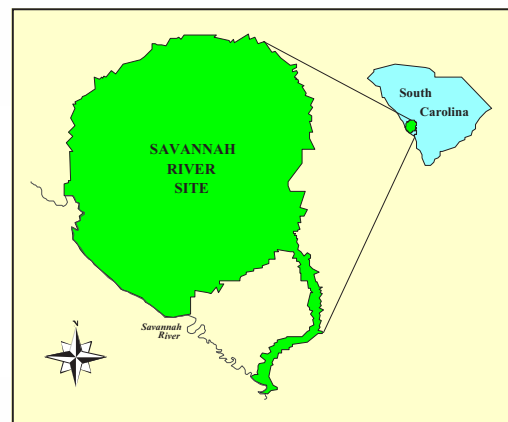
- **Analyze data from:**
 - One location
 - Long time frame
 - Large sample size
- **Analyze data on:**
 - Female parameters
 - Litter size & composition
 - Male parameters
 - Breeding season
 - Chronological variation



Wild Pig Reproductive Biology

Study Site

- **Savannah Rive Site (SRS),** located in western South Carolina
- **800 km² Federal nuclear facility**
- **95% of the site land is undeveloped**
- **Wild pig population has been present onsite for over 60 years**
- **Population is wild boar x feral hog hybrid in composition, which has changed over time**



Wild Pig Reproductive Biology

Methods

Collected between 1969 and 2009:

- Date of collection
- Age class
- Total body mass
- Females checked for:
 - Pregnancy
 - Lactation
- Males checked for
 - Injuries/scars
 - Shoulder shield thickness



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Methods

Litter size and composition:

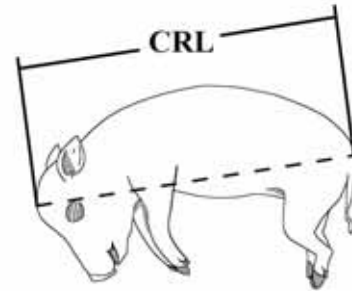
- Litter size
 - Fetal
 - Neonatal
 - Post-natal (litters with one sow)
 - Lactating teat counts
- Litter sex ratio
 - Fetal
 - Neonatal



Methods

Subset of pregnant sows (N=323):

- Sows aged in days (Matschke 1967)
- Fetal age in days (Henry 1968)
- Assume 115-day gestation
- From the collection date -
 - Calculate Conception Date
 - ↳ • Sow's Age at Conception
 - Calculate Farrowing Date
 - ↳ • Sow's Age at Farrowing



Results – Female Parameters

A total of 2,483 sows examined:

- 712 (29%) were pregnant
- 348 (14%) were lactating
- 52 (7%) of the pregnant sows were also nursing a litter of piglets

17-year Hawaiian Study (Hess et al. 2006):

- Sample size = 327
- Pregnant – 77 (24%)
- Lactating – 34 (10%)
- Both – 2 (1%)

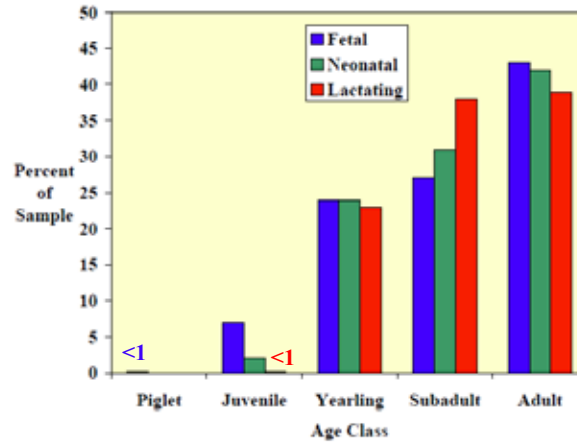


Results – Female Parameters

Female age class participation in reproduction:

Percent composition increased with age for

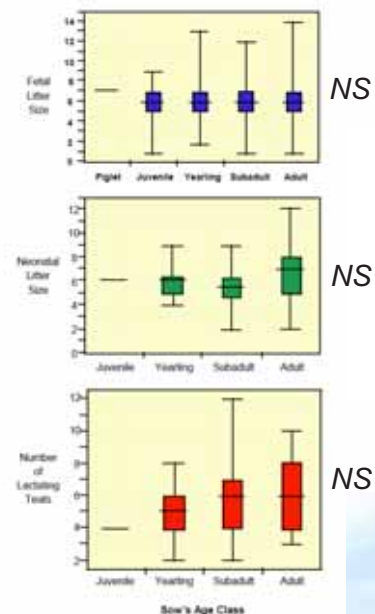
- Pregnant sows (N=712)
- Sows with neonatal litters in farrowing nests (N=45)
- Lactating sows (N=348)



Results – Female Parameters

Litter size variation due to sow's age class:

- Litter size did not significantly increase with age class of the sow for the following samples –
 - Fetal Litter Size (N=712)
 - Neonatal Litter Size (N=45)
 - Number of Lactating Teats (N=348)

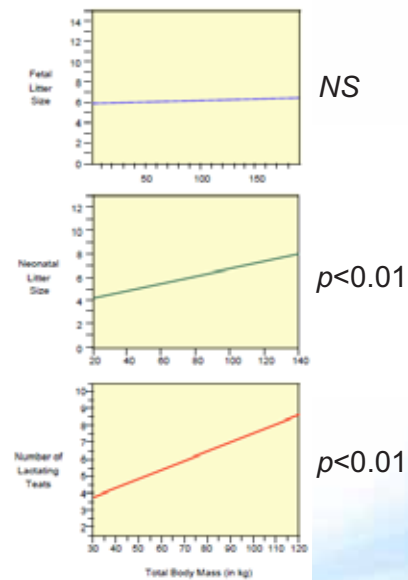


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Results – Female Parameters

Litter size variation due to sow's total body mass (TBM):

- Litter size did not significantly increase with the sow's TBM for fetal litter size (N=712 sows)
- Litter size did significantly increase ($p < 0.01$) with the sow's TBM for -
 - Neonatal litter size (N=45 sows)
 - Number of lactating teats (N=348 sows)

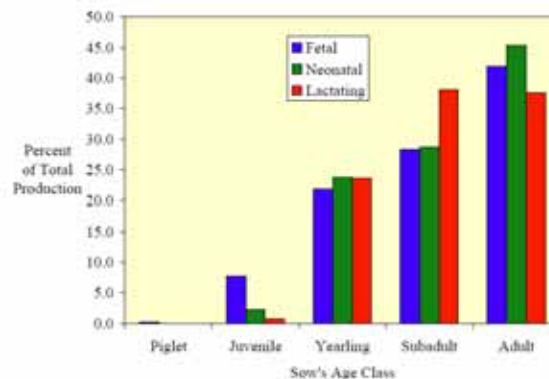


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Results – Female Parameters

Age class specific production of offspring:

- Total numbers of offspring produced did significantly increase with the sow's age for -
 - Fetal sample (N=4,383)
 - Neonatal sample (N=269)
 - Lactation sample (N=1,993)



Wild Pig Reproductive Biology Results - Female Parameters

Sow's Age Class at Conception & Farrowing (N=323)

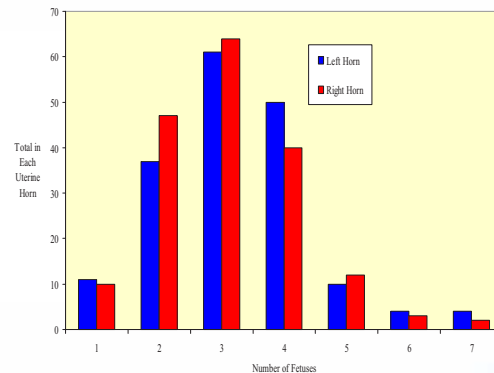
	Piglet	Juvenile	Yearling	Subadult	Adult
% of Total	5	13	24	30	28
% of Total	0	8	16	40	35



Wild Pig Reproductive Biology Results – Female Parameters

Uterine horn implantation:

- Sample size of 1,118 fetuses/embryos
- Ratio of 51% left to 49% right (NS)
- One litter was only present in the right horn
- Opposite situation was not observed



Wild Pig Reproductive Biology
Results – Litter Size

**Fetal Counts
(N=712):**

- Mean = 6.2
- Mode = 6
- Range = 1 to 14

**Neonatal Counts
(N=64):**

- Mean = 5.4
- Mode = 5
- Range = 1 to 11

**Post-Natal Counts
(N=99):**

- Mean = 4.3
- Mode = 3
- Range = 1 to 10

**Lactating Teat Counts
(N=348):**

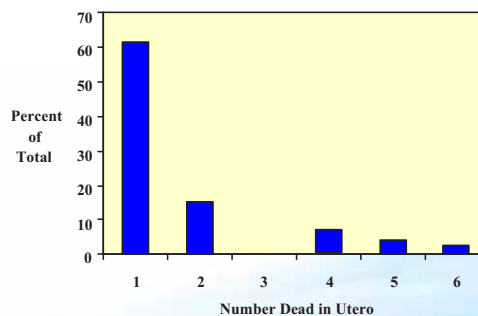
- Mean = 5.9
- Mode = 6
- Range = 2 to 12



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Results – Litter Size

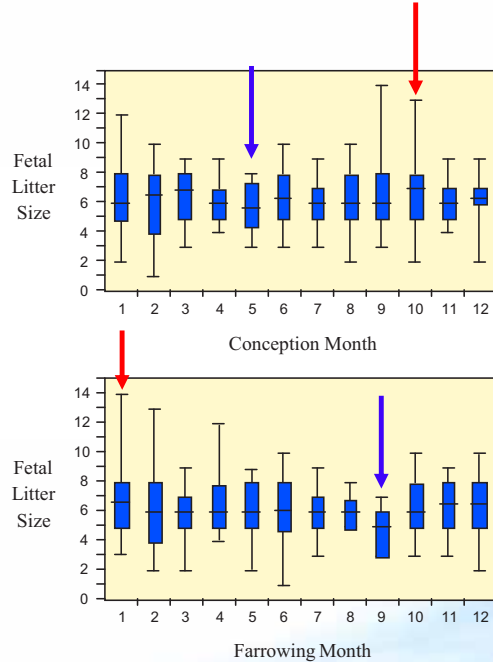
Intrauterine mortality:

- 7.2% of the fetuses/embryos were dead *in utero*
- Ranged from 1 to 6 dead fetuses/embryos per sow
- Most (62%) only had one dead fetus/embryo
- Intrauterine mortality increased with litter size ($p < 0.01$)



Wild Pig Reproductive Biology Results – Litter Size

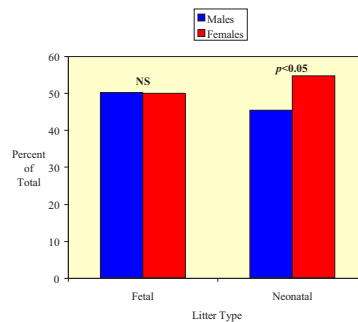
- **Largest fetal litters**
 - Conceived in Oct
 - Farrowed in Jan
- **Smallest fetal litters**
 - Conceived in May
 - Farrowed in Sep
- **None of these monthly differences in fetal litter size were significant**



Wild Pig Reproductive Biology Results – Litter Size

Litter sex ratio:

- Based on a sample of 1,110 fetuses, 556 were males and 554 were females (NS)
- Based on a sample of 446 neonates, 202 were males and 243 were females ($p < 0.05$)

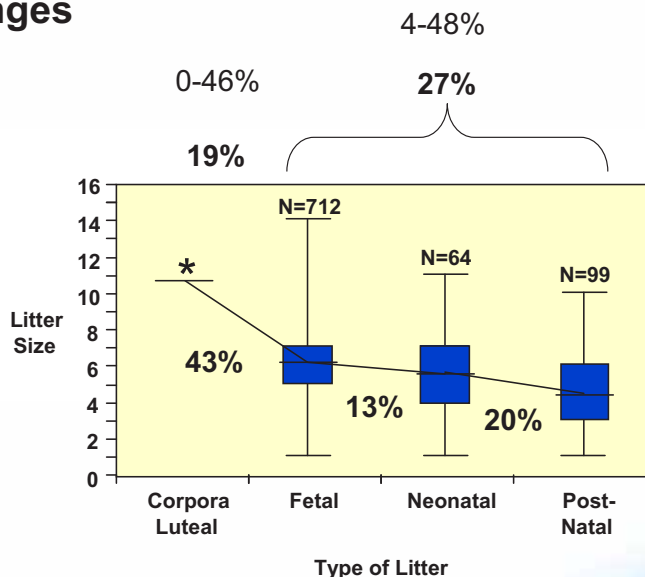


Sex	M	M:F	F
Fetal	3%	95%	2%
Neonatal	7%	84%	9%



Wild Pig Reproductive Biology Results – Litter Size

Ontogenic changes in Litter Size:



* Sweeney et al. 1979
and Sweeney 1979



Wild Pig Reproductive Biology Results – Male Parameters

- Total of N=721 boars examined
- Most boars don't significantly participate in breeding until yearling age class
- Based on presence of open wounds and scars indicative of male-male fighting, over 70 percent of active breeding boars are adults
- One captive SRS boar (~4-5 months old) bred five much larger adult sows in same enclosure

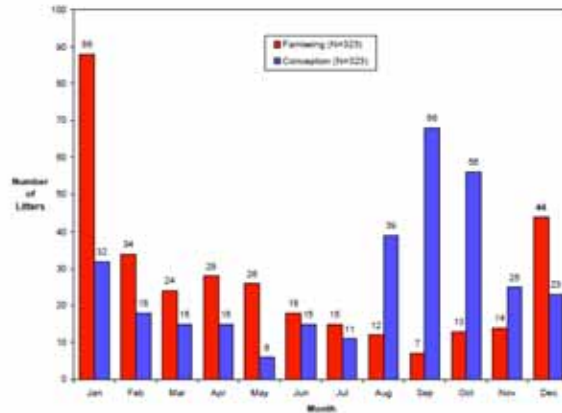


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Results - Breeding Season

Breeding season (N=323):

- Occurs year-round
- Peak of conception in Sep (Aug-Oct)
- Peak of farrowing in Jan (Dec-Feb)
- Secondary peaks
 - Conception - Jan
 - Farrowing – Apr-May



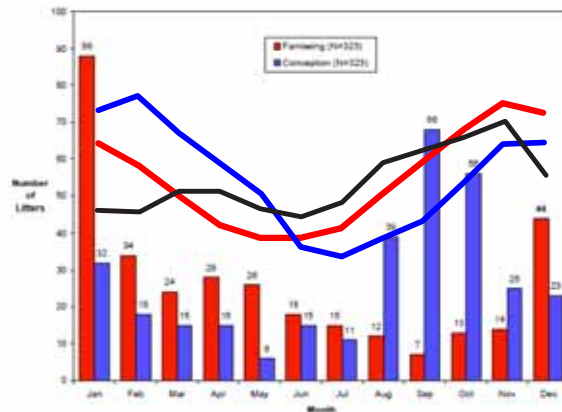
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Results - Breeding Season

Breeding season:

- Comparisons with –
 - Mean percent of pregnant sows per month
 - Mean percent of lactating sows per month
 - Mean thickness of the shoulder shields per month

— - Mean Pregnant Sows/Month
— - Mean Lactating Sows/Month
— - Mean Shield Thickness/Month

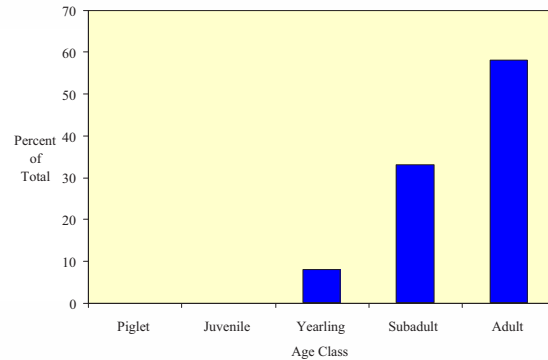


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Results - Breeding Season

Breeding season (cont.):

- Mean incidence of pregnancy at SRS = 1.4 litters/year
- 7% of the sows found to have produced two litters per year (i.e., pregnant sows nursing a litter of piglets)
- Increased with age

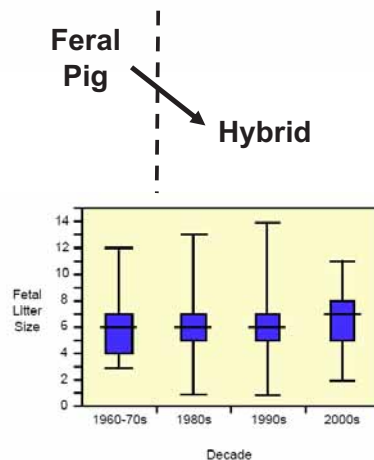


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Results – Chronological Variation

Fetal litter size variation among decades:

- No significant difference among the decades
- Predicted decrease due to influx of the hybrid phenotype not realized



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Conclusions

- Reproductive participation and total offspring production increased with sow's age
- Mean litter size did not increase with the sow's age
- Sow's TBM becomes increasingly related to litter size
- Mean litter size decreased from CL through PN counts
- Sex ratio changes from fetal to neonatal stages
- Most of the breeding is done by mature males
- Breeding occurred year-round with primary and secondary peaks of conception and farrowing
- No chronological changes due to changing taxonomic composition of population

