

Final Report Tables and Figures

Table 1. Sampling for genetic analysis.

Breed	# samples analyzed	# Bloodlines Collected	Conservation Status*
Choctaw (C)	9	1	Critical
Guinea Hogs (AGH)	24	5	Threatened
Gloucestershire Old Spots (GOS)	49	11	Threatened
Hereford (HER)	8	1	Watch
Large Black (LB)	24	2	Threatened
Mulefoot (MF)	11	2	Critical
Ossabaw Island (OSS)	22	3	Critical
Red Wattle (RW)	38	7	Threatened
Tamworth (TAM)	11	2	Threatened
Meishan (MC)	22	Unknown	N/A

* Status on the 2015 Conservation Priority List. This list is compiled each year by The Livestock Conservancy from census data.

Table 2. Percent of loci that were polymorphic (P)

Breed	%P	Breed	% P
C	90.91	MF	84.85
AGH	100.00	OSS	96.97
GOS	96.97	RW	100.00
HER	93.94	TAM	93.94
LB	93.94	MC	100.00

Table 3. Mean Allelic frequencies (N_A) \pm S.E. and Allelic Richness (AR)

Population	N	N_A	AR
Choctaw (C)	9	2.33 \pm 0.13	2.86
Guinea Hog (AGH)	24	3.79 \pm 0.26	2.61
Gloucestershire Old Spots (GOS)	49	3.33 \pm 0.33	3.31
Hereford (HF)	8	3.00 \pm 0.19	1.65
Large Black (LB)	24	2.97 \pm 0.24	2.90
Mulefoot (MF)	11	2.70 \pm 0.20	2.48
Ossabaw (OS)	22	3.64 \pm 0.24	2.56
Red Wattle (RW)	38	4.27 \pm 0.28	2.35
Tamworth (TAM)	11	3.30 \pm 0.22	2.79
Meishan-China (MC)	22	4.36 \pm 0.23	3.24

Figure 1. Mean Allelic Frequencies (NA) and Allelic Richness (AR) for 10 breeds of pigs.

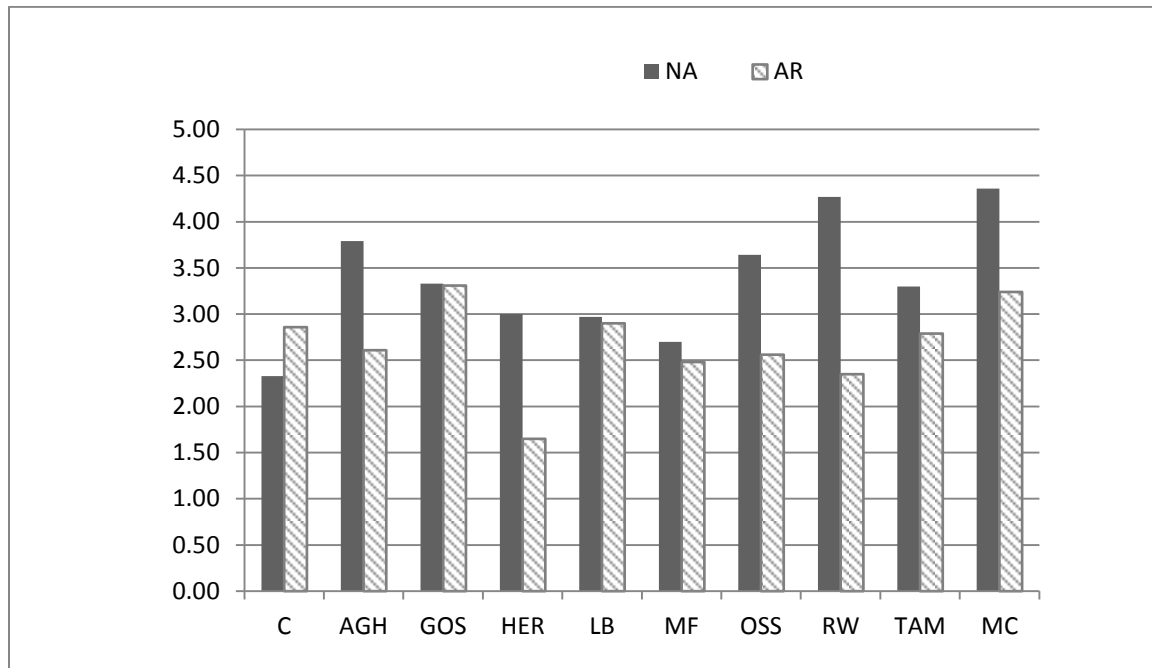


Table 4. Heterozygosity and inbreeding in endangered breeds of pigs

Population	N	H _o	H _E	F _{IS}	CI**
Choctaw (C)	9	0.51 ± 0.05	0.41 ± 0.03	-0.190	NA
Guinea Hog (AGH)	49	0.47 ± 0.04	0.48 ± 0.04	0.035	12.1
Gloucestershire Old Spots (GOS)	24	0.37 ± 0.04	0.37 ± 0.04	0.022	8.9
Hereford (HF)	8	0.44 ± 0.05	0.44 ± 0.04	0.062*	NA
Large Black (LB)	24	0.40 ± 0.05	0.43 ± 0.04	0.087*	12.7
Mulefoot (MF)	11	0.34 ± 0.05	0.34 ± 0.04	0.052*	NA
Ossabaw (OS)	22	0.45 ± 0.04	0.48 ± 0.04	0.084*	14.1
Red Wattle (RW)	38	0.47 ± 0.04	0.51 ± 0.03	0.095*	7.8
Tamworth (TAM)	11	0.61 ± 0.05	0.50 ± 0.04	-0.174	NA
Meishan-China (MC)	22	0.57 ± 0.04	0.58 ± 0.03	0.046	NA

*F_{IS} is significantly different than zero, p < .05

**Coefficient of Inbreeding, calculated on pedigrees for all registered animals in 2011. NA = not available.

Figure 2. Analysis of breed relationships using Nei's standard

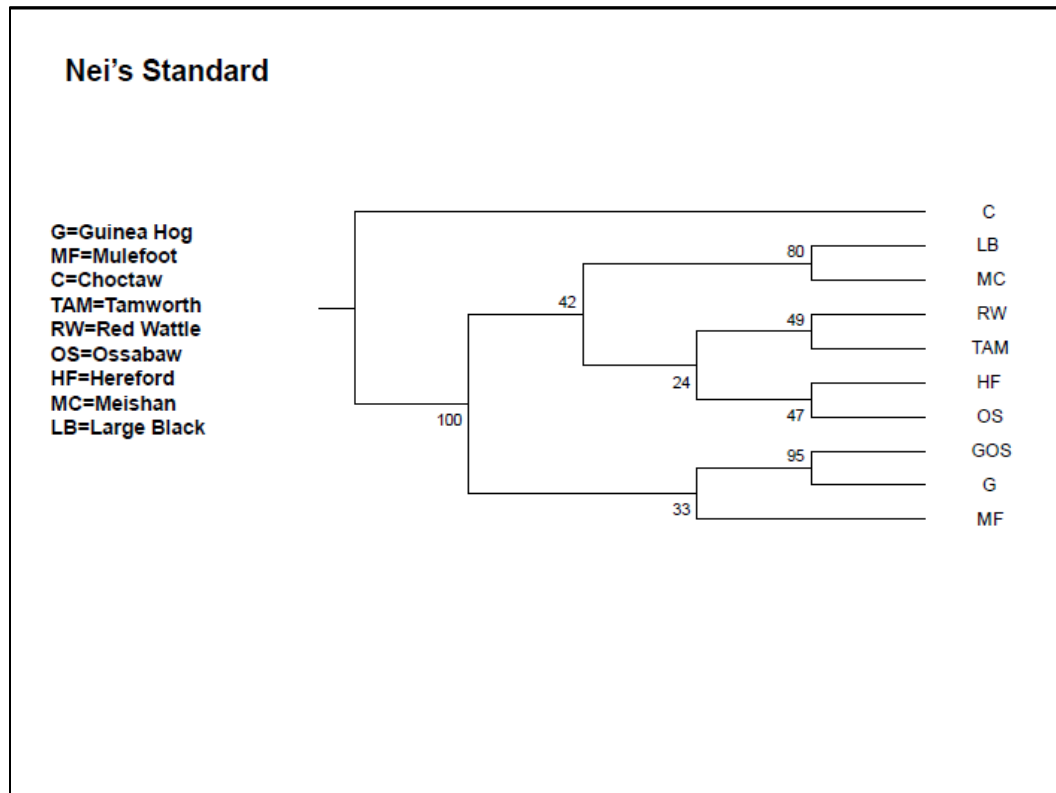


Figure 3. POSA analysis of breed relationships

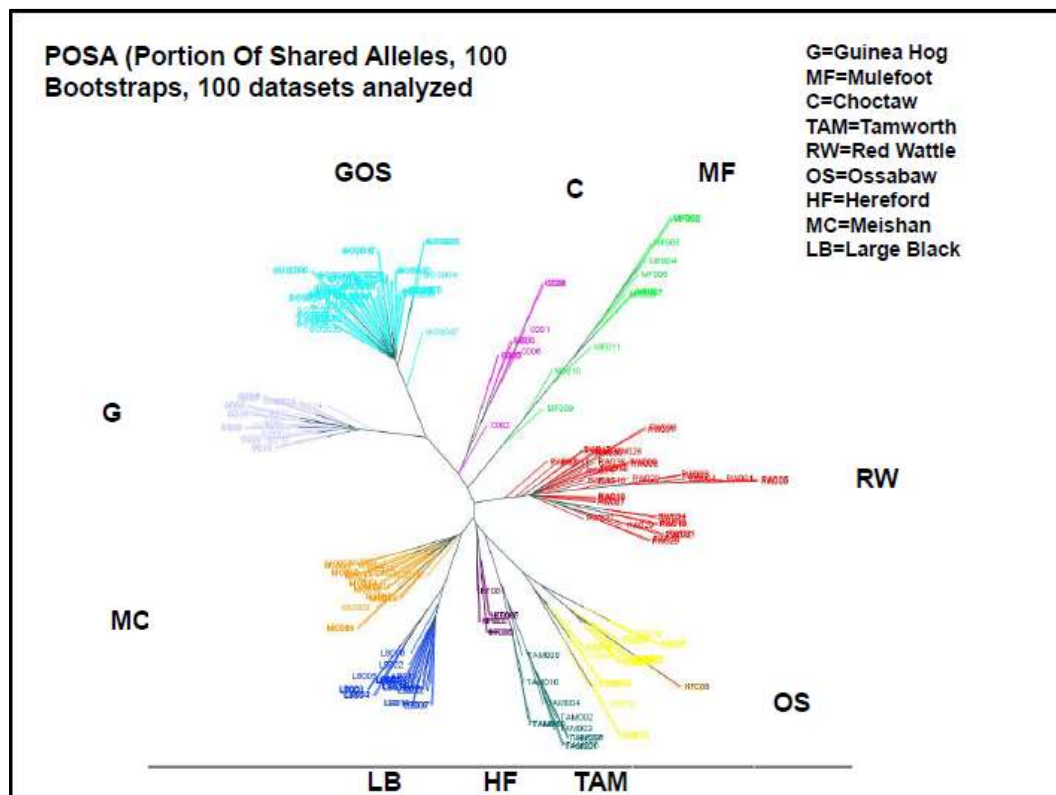


Figure 4. Number of Breeders for five endangered swine breeds

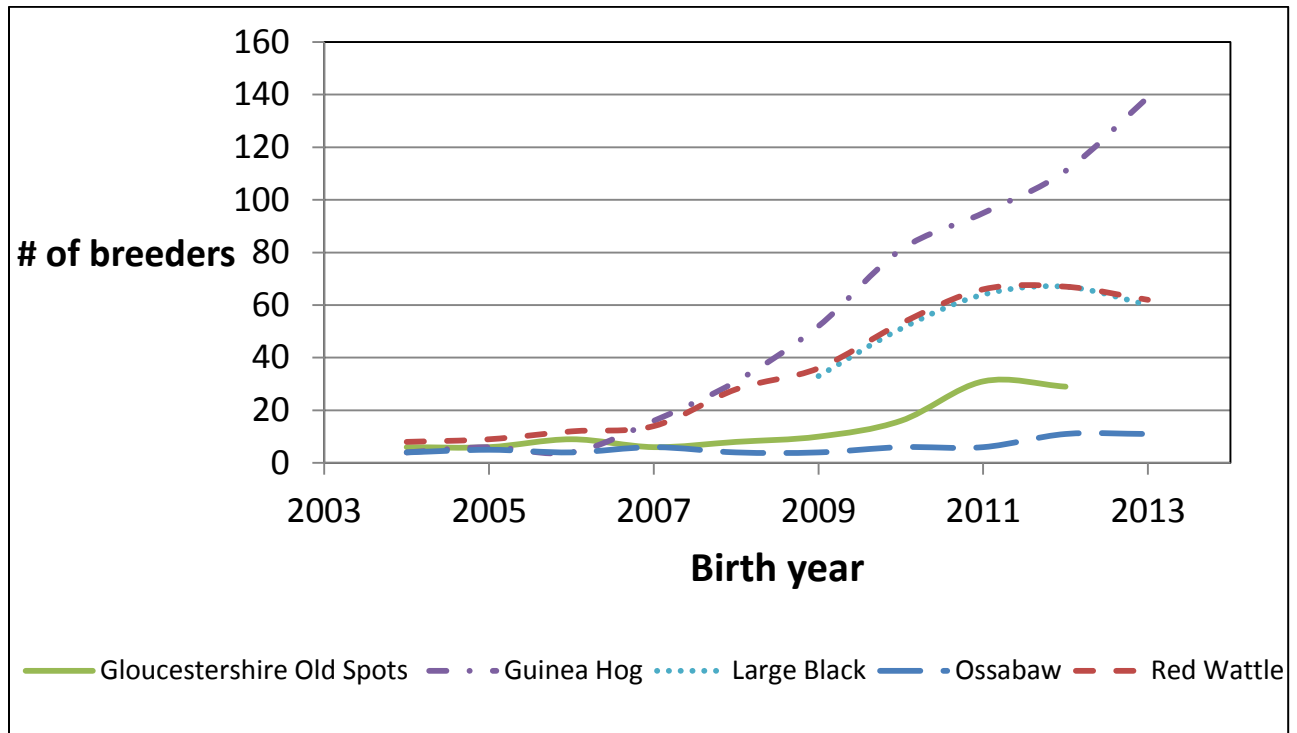


Figure 5. Number of pigs in five breed registries for endangered breeds

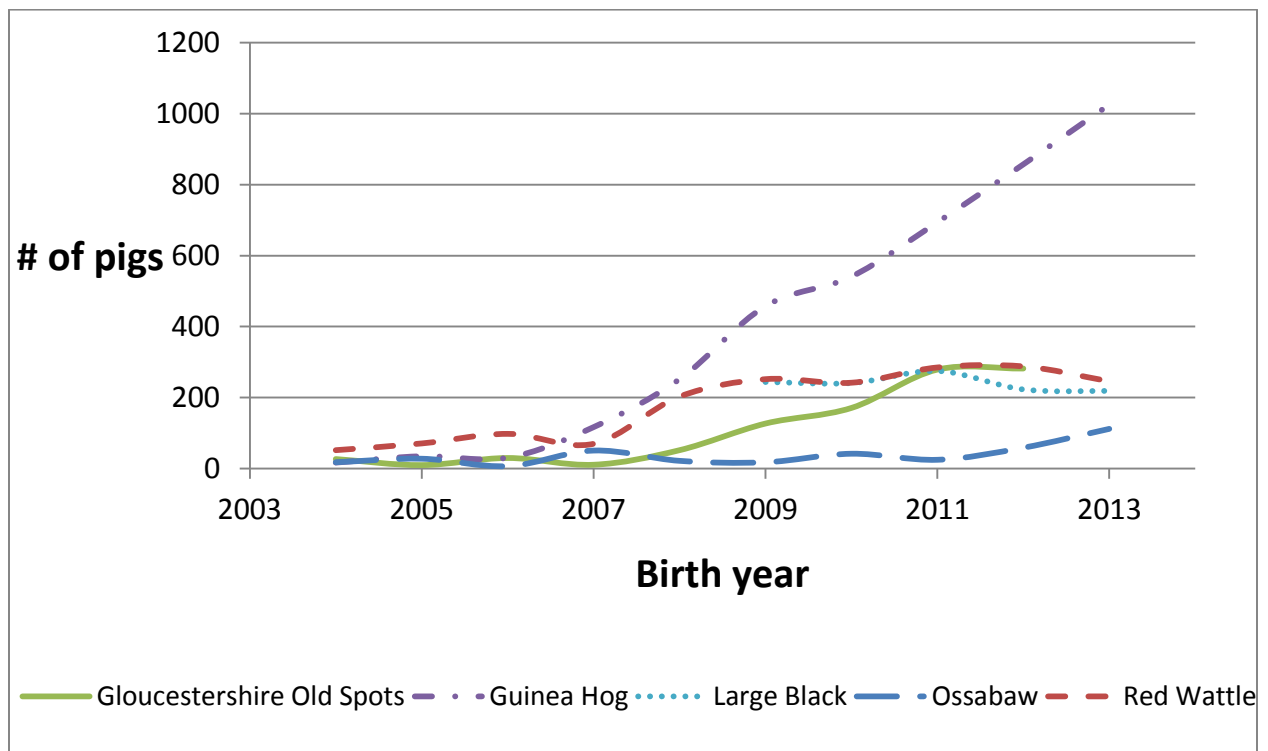


Table 5. Coefficient of Inbreeding (%) for five endangered hog breeds

Year	GOS	GH	LB	OSS	RW
2004	0.97	11.03		3.65	6.29
2005	1.44	3.57		4.02	4.63
2006	2.29	6.65		8.93	13.47
2007	4.08	10.62		2.70	13.46
2008	6.62	9.15		3.41	9.62
2009	7.17	9.91	12.74	11.11	8.85
2010	8.09	10.61	12.65	6.70	7.63
2011	8.87	12.09	12.71	14.13	7.81
2012	8.76	11.18	10.41	9.48	8.84
2013		12.78	11.59	16.48	10.11

Figure 6. Coefficient of inbreeding for five endangered hog breeds

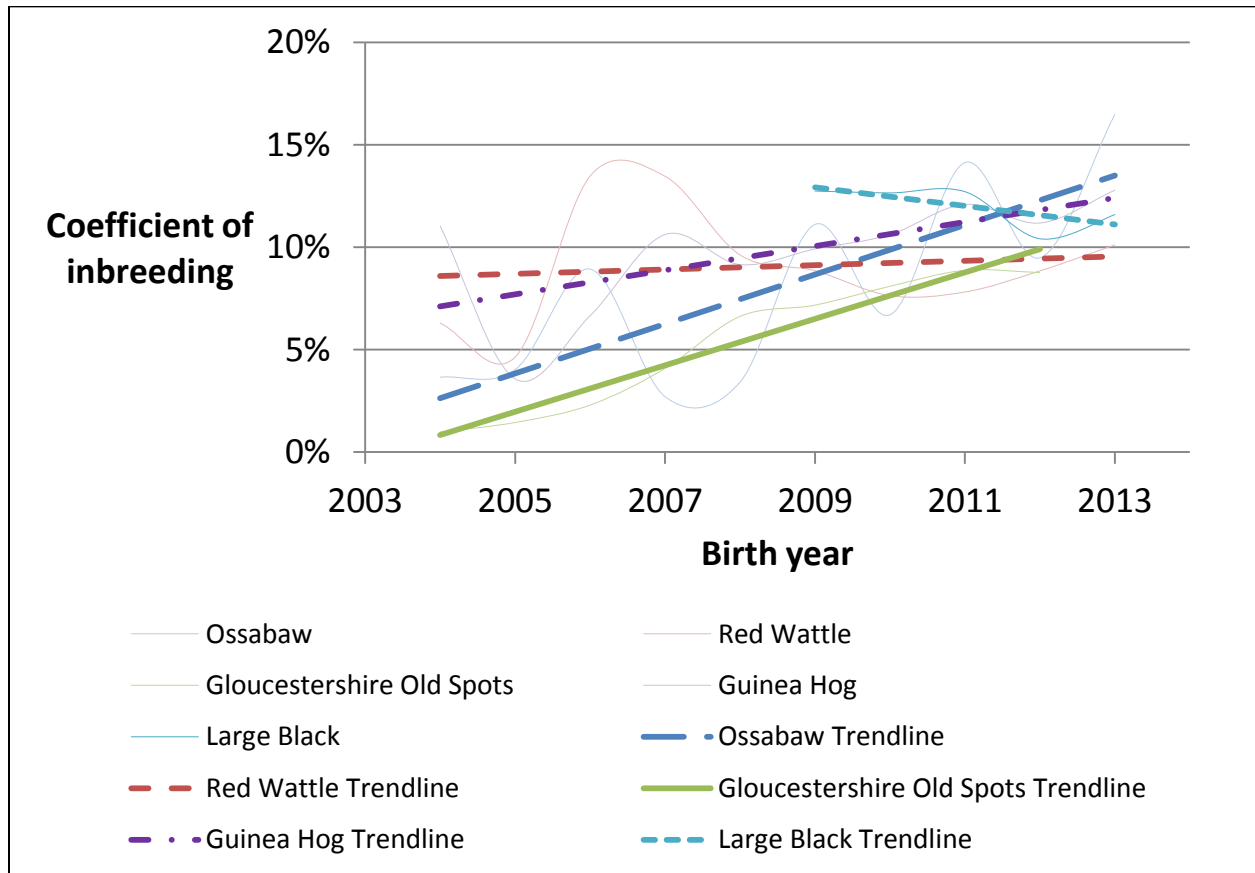


Table 6. Census of registered animals for nine heritage breeds of pigs (annual new registrations)

Breed	# new registrations 2010	# new registrations 2013
Choctaw	50-100	<100
American Guinea Hog	322	1267
Gloucestershire Old Spots	232	391
Hereford	2045	NA
Large Black	41	250
Mulefoot	164	NA
Ossabaw Island	26	112
Red Wattle	245	278
Tamworth	1374	1785

NA: Registration numbers not available – did not receive a response from the registry

Table 7. Educational Guides.

Title	Author
Feeds and Feeding of Heritage Breed Pigs	Dale Rozeboom
Keys to Cost Management for Extensive Pork Production	David Stender
Heritage Pigs: Selecting Breeding Stock	Mark Knauer & Alison Martin
Biosecurity for Pastured Pigs	Joshua Schaeffer
Common Health Concerns of Pastured Pigs	Joshua Schaeffer
Control of Inbreeding for Productivity and Genetic Conservation in Swine	Mark Knauer
Detection of Estrus in Pigs	Wayne Singleton
Artificial Insemination Basics for Pastured Pigs	Wayne Singleton
Preparing for Farrowing	Wayne Singleton
Heritage Hog Processing and Products	Gregg Rentfrow
Marketing Your Heritage Pork Products	Alison Martin

Table 8. Mean body weight and Average Daily Gain (ADG) of eight endangered pig breeds grown on pasture.

Breed ¹	N	Body weight at Harvest (lbs)	Age at Harvest (mos)	ADG Mean \pm Standard Deviation	Coefficient of Variation	ADG – male	ADG - female
AGH	7	193	8-10.5	0.689 \pm .097	.14	0.650	0.741
GOS	6	247	8-10.5	1.885 \pm .247	.13	1.862	1.933
HER	7	333	9.5-11.5	1.172 \pm .158	.15	1.321	1.113
LB	7	309	7-8.5	1.594 \pm .082	.05	1.606	1.522*
MF	6	291	8-10.5	1.093 \pm .084	.08	1.057	1.129
OSS	7	244	10.5-12.5	0.635 \pm .141	.22	0.723	0.568
RW	6	300	7.5	1.420 \pm .086	.06	Not available	Not available
TAM	7	318	6.5-8.5	2.073 \pm .573	.27	2.118	1.801*

¹ AGH = American Guinea Hog; GOS = Gloucester Old Spots; HER = Hereford; LB = Large Black; MF = Mulefoot, OSS = Ossabaw Island, RW = Red Wattle, TAM = Tamworth

* only one pig of this gender in this sample

Table 9. Carcass characteristics of eight endangered pig breeds grown on pasture.

Breed	Live Weight (lbs)	Hot Carcass Wt (HCW) (lbs)	Hot Carcass Yield (%)	American Cut Yield (% HCW) (Ham, Loin, Butt, Picnic, Sparerib, Belly)	Lean Cut Yield (% HCW) (Ham, Loin, Butt, Picnic)	European Cut Yield (% HCW) (Ham, Belly, Boneless Loin, Tenderloin, Shoulder, Jowls, Coppa, Presia, Pluma)	10th rib Back Fat (in.)	Loin Eye Area (sq. in.)
AGH	193 \pm 21	140 \pm 17	73	66	43	68	3.1 \pm 0.2	2.9 \pm 0.3
GOS	247 \pm 47	156 \pm 38	63	71	55	69	2.2 \pm 0.5	5.3 \pm 1.0
HER	333 \pm 26	252 \pm 22	76	75	56	69	2.7 \pm 0.4	6.8 \pm 0.4
LB	309 \pm 38	229 \pm 29	74	69	51	66	2.6 \pm 0.3	4.2 \pm 0.6
MF	291 \pm 40	209 \pm 30	72	67	46	65	2.1 \pm 0.5	4.2 \pm 0.3
OSS	244 \pm 34	188 \pm 26	77	69	46	66	3.5 \pm 0.5	4.3 \pm 0.3
RW	300 \pm 20	224 \pm 18	74	65	45	66	2.8 \pm 0.2	4.5 \pm 0.9
TAM	318 \pm 39	231 \pm 40	72	75	56	73	2.1 \pm 0.4	6.1 \pm 0.7

Table 10. American cuts as % of carcass weight

	Butt	Picnic	Loin	Sparerib	Belly	Ham	% hot carcass
AGH	5.5	7.7	13.3	2.5	20.6	16.6	66
GOS	8.9	8.6	17.1	3.8	12.0	20.6	71
HER	7.3	9.3	17.9	3.2	16.5	21.3	75
LB	6.5	8.3	17.3	2.4	16.5	18.5	69
MF	6.4	8.3	12.5	3.4	17.0	19.2	67
OSS	5.7	8.8	14.7	3.0	19.4	17.0	69
RW	6.3	7.0	12.4	3.3	17.2	19.2	65
TAM	7.3	9.6	18.2	3.2	15.9	20.7	75

Table 11. European cuts as % of hot carcass weight

	Ham	Belly	Boneless Loin	Shoulder	Jowls	Coppa	Presia	Pluma	Tenderloin Untrimmed	% hot carcass
AGH	21.3	18.1	5.1	16.4	1.7	3.6	0.1	1.3	1.0	68
GOS	22.9	11.6	7.1	17.8	-	4.8	0.2	1.5	1.4	69
HER	24.1	12.5	6.1	17.5	1.3	4.3	0.2	2.0	1.4	69
LB	20.9	14.9	5.8	16.1	1.7	4.0	0.2	1.4	1.4	66
MF	21.2	13.4	5.2	17.0	-	3.6	0.2	1.5	1.1	65
OSS	20.0	15.5	5.2	16.1	1.6	3.9	0.2	1.5	1.5	66
RW	20.5	14.3	6.3	16.2	0.4	3.4	0.2	1.6	1.0	66
TAM	24.0	14.0	5.9	16.3	1.9	4.8	0.2	1.5	1.2	73