Hog color inheritance

Four major loci

1. Extension locus (E,E^D and e alleles)
    a. Differences in genotypes at this locus result in black vs black spotted vs non-black-based colors (all* with dark skin)

2. Dilution locus (D and d alleles)**
    a. Presence of the D alleles causes dilution of red to sandy (in heterozygotes) and to white or off-white (in heterozygotes). That is, the D allele causes dilution of red color but not of back color.

3. Pattern locus (K and k alleles)
    a. Homozygosity of the k allele causes hogs with a black spotted base color to be black with six white points (feet, nose and tail)

4. Inhibition locus (I,I^L, and i alleles)***
    a. Homozygotes of the I allele have full expression of their base color
    b. Presence of the I^L allele cause a white belt on colored hogs
    c. Presence of the I allele inhibits pigment formation, resulting in white
        i. Homozygotes of the I allele are totally white
        ii. Heterozygotes of the I allele are at least predominantly white
            1. Hogs with the E_ __ __ Ii or E_ __ __ II^L genotypes are blue butts
            2. Hogs with the E^F_ _d __ Ii, ee DD __ Ii, E^F_ DD. __ II^L, or ee DD __ II^L genotypes are white; however, some have a few dark skin spots
            3. Hogs with the E^F __ d __ Ii, ee _d __ Ii, E^F _ _d __ Ii, E^F __d. __ II^L, or ee_d. __ II^L genotypes are white; however, many have a red tint to the hair and some have a few dark skin spots

*most black and white spotted hogs have some white skin

** there is evidence that there are at least two separate dilution loci, with cumulative effects

*** there is a fourth allele, I^D, at this locus, that is present in at least some of the white breeds. Hogs that have the I^Di or I^DI^L genotype have more color than hogs with the Ii or II^L genotype, in at least some genetic combinations

Order of dominance

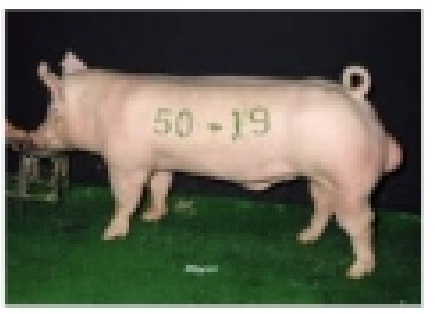
Locus	Extension	Dilution	pattern	inhibition
Most dominant	E	D, d*	K	I^L
Next in order of dominance	E^p			
Most recessive	e		k	i

*No dominance at the dilution locus. (That is, the heterozygote is intermediated to the two alternative homozygotes.): only red color is diluted

IMPORTANT NOTES:

1. All hogs that have the I allele are at least predominantly white
    a. Homozygotes (II) are completely white, regardless of their genotype at the other three loci
    b. Heterozygotes (either II^L or Li) will be at least predominantly white, as discussed on the previous page (note that blue butts are predominantly white)
2. Hogs that are E_ii are black, regardless of their genotypes at the other two loci. Those that are E_I^LI^L or E_I^Li are black belted, regardless of their genotype at the other two loci
3. Assume that all hogs that are E^pE^p kk ii or E^pe kk ii are black with six white points, regardless of their genotype at the dilution locus (the actual inheritance mat be at least somewhat more complicated than this)

Description of breeds

Breed	Typical Genotype	Typical Color
Hampshire 	$EE\ dd\ KK\ I^{L}I^{L}$	Black with white belt
Duroc 	ee dd KK ii	Red
Yorkshire 	$E^{P}E^{P}$ DD KK II	white
Landrace 	$E^{P}E^{P}$ DD KK II	White
Chester White 	$E^{P}E^{P}$ DD KK II	White