

Breeding System

Genetic Interactions:

Coat:

Coloration/Pattern:	Percentage:	Genetic Structure:
Black	35%	EE / Ee (<i>Dominant Extension Gene</i>)
Jet Black	100%	EE (<i>Homozygous Dominant Extension Gene</i>)
Chestnut	50%	ee (<i>Recessive Extension Gene</i>)
Red Chestnut	30%	
Golden Chestnut	20%	
Bay	100%	EE / Ee + AA / Aa (<i>Dominant Extension Gene & Dominant Agouti Gene</i>)
Wild Bay	50%	Ee + Aa (<i>Heterozygous Extension Gene & Heterozygous Agouti Gene</i>)
Hidden Bay	50%	
	100%	ee + AA / Aa (<i>Recessive Extension Gene & Dominant Agouti Gene</i>)
Grey	30%	GG / Gg (<i>Dominant Grey Gene</i>)
Light Grey	30%	GG (<i>Homozygous Dominant Grey Gene</i>)
White grey	25% / x	GG (<i>Homozygous Dominant Grey Gene</i>)
Dapple Grey	25% / x	GG / Gg (<i>Dominant Grey Gene</i>)
Dark Grey	20% / 25%	Gg (<i>Heterozygous Dominant Grey Gene</i>)
Fleabitten	x / 25%	Gg (<i>Heterozygous Dominant Grey Gene</i>)
Bloodmarked	15%	Gg (<i>Heterozygous Dominant Grey Gene</i>)
	5%	
White	60%	Ww (<i>Heterozygous Dominant White Gene</i>)
Partial White	20%	
Body Spots	20%	
Ghost (<i>Lethal White</i>)	100%	WW (<i>Homozygous Dominant White Gene</i>) *Cancels out All other Genes Unless Otherwise Stated!

Flaxen	100%	ee + ff (<i>Recessive Extension Gene & Homozygous Recessive Flaxen Gene</i>)
Hidden Flaxen	92%	EE / Ee + ff (<i>Dominant Extension Gene & Recessive flaxen Gene</i>)
Unnatural Flaxen	8%	EE / Ee + ff (<i>Dominant Extension Gene & Recessive flaxen Gene</i>)
Silver Gene:	----- --	ZZ / Zz
Silver		EE / Ee + ZZ / Zz (<i>Dominant Extension Gene & Dominant Silver Gene</i>)
Silver Dapple	65% / 55%	EE / Ee + ZZ (<i>Dominant Extension Gene & Homozygous Silver Gene</i>)
Partial Silver	35% / x	EE / Ee + Zz (<i>Dominant Extension Gene & Heterozygous Silver Gene</i>)
Silver Bay	x /	AA / Ae + ZZ / Zz (<i>Dominant Extension Gene & Dominant Silver Gene</i>)
Silver Dapple Bay	45%	AA / Aa + ZZ (<i>Dominant Extension Gene & Homozygous Silver Gene</i>)
Partial Silver Bay	80% / 45%	AA / Aa + Zz (<i>Dominant Extension Gene & Heterozygous Silver Gene</i>)
Silver Gray	20% / x	GG / Gg + ZZ / Zz (<i>Dominant Gray Gene & Dominant Silver Gene</i>)
Subtle Silver Gray	x /	GG / Gg + Zz (<i>Dominant Gray Gene & Heterozygous Silver Gene</i>)
Silver White	55%	Ww + ZZ / Zz (<i>Dominant Gray Gene & Dominant Silver Gene</i>)
Hidden Silver	60%	ee + ZZ / Zz (<i>Recessive Extension Gene & Dominant Silver Gene</i>)
Unnatural Silver	80% 56%	ee + ZZ / Zz (<i>Recessive Extension Gene & Dominant Silver Gene</i>)
	92% 8%	
Cream Gene:	----- --	CCr / Ccr
Smoky Black		EE / Ee + Ccr (<i>Dominant Extension Gene & Heterozygous Cream Gene</i>)
Buckskin	35%	AA / Aa + Ccr (<i>Dominant Agouti Gene & Heterozygous Cream Gene</i>)
Palomino	100% 100%	ee + Ccr (<i>Recessive Extension Gene & Heterozygous Cream Gene</i>)
Smoky Cream		EE / Ee + CCr (<i>Dominant Extension Gene & Homozygous Cream Gene</i>)
Perlino	60%	AA / Aa + CCr (<i>Dominant Agouti Gene & Homozygous Cream Gene</i>)
Cremello	100% 100%	ee + CCr (<i>Recessive Extension Gene & Homozygous Cream Gene</i>)

Champagne	95% / 80%	CC / Cc (<i>Dominant Champagne Gene</i>)
Cream Champagne	50% / 35%	Ccr + CC / Cc (<i>Heterozygous Cream Gene & Dominant Champagne Gene</i>)
Pearl Champagne	45% / 30%	PP + CC / Cc (<i>Homozygous Pearl Gene & Dominant Champagne Gene</i>)
Triple Champagne	8%	Ccr + PP + CC / Cc (<i>Heterozygous Cream, Homozygous Pearl & Champagne</i>)
Gray Champagne	25%	GG / Gg + CC / Cc (<i>Dominant Grey Gene & Dominant Champagne Gene</i>)
Hidden Champagne	95% / 80%	CCR + CC / Cc (<i>Homozygous Cream Gene & Dominant Champagne Gene</i>)
Pearl	80%	PP (<i>Homozygous Pearl Gene</i>)
Golden Pearl	75%	ee + PP (<i>Recessive Extension Gene & Homozygous Pearl Gene</i>)
Black Pearl	20%	EE + PP (<i>Homozygous Extension Gene & Pearl Gene</i>)
Cream Pearl		CCr + PP (<i>Homozygous Cream Gene & Homozygous Pearl Gene</i>)
Bright Pearl		Ccr + PP (<i>Heterozygous Cream Gene & Homozygous Pearl Gene</i>)
Champagne Pearl		CC / Cc + PP (<i>Homozygous Pearl Gene</i>)
Triple Dilute Pearl	8%	Ccr + CC / Cc + PP (<i>Heterozygous Cream, Champagne & Homozygous Pearl</i>)
Gray Pearl		
Silver Pearl		
White Pearl		

Sooty		SS / Ss (Dominant Sooty Gene) AA / Aa + SS / Ss (Dominant Agouti Gene & Dominant Sooty Gene) ee + SS / Ss (Recessive Extension Gene & Dominant Sooty Gene)
Dark Sooty		SS (Homozygous Sooty Gene)
Marbled Sooty		SS / Ss (Dominant Sooty Gene)
Dappled Sooty		SS / Ss (Dominant Sooty Gene) AA / Aa + SS / Ss (Dominant Agouti Gene & Dominant Sooty Gene) ee + SS / Ss (Recessive Extension Gene & Dominant Sooty Gene)
Subtle Sooty		Ss (Heterozygous Sooty Gene)
Grease Spots		ee + Ss (Recessive Extension Gene & Recessive Sooty Gene)
Sooty Cream		
Sooty Champagne		
Sooty Pearl		
Hidden Sooty		EE / Ee + SS / Ss (Dominant Extension Gene & Dominant Sooty Gene)
Pangare		PA / Pa (Dominant Pangare Gene)
Tan Pangare		PA / Pa (Dominant Pangare Gene) AA / Aa + PA / Pa (Dominant Agouti Gene & Dominant Pangare Gene) PA / Pa (Dominant Pangare Gene)
Subtle Pangare		SS / Ss + PA / Pa (Dominant Sooty Gene & Dominant Pangare Gene)
Roan	80%	RR / Rr
Rabicano	65%	RRa / Rra (Dominant Rabicano Gene)
Dun	100%	DD / Dd (Dominant Dun Gene)
Faint Dun		CCR + DD / Dd PP + DD / Dd GG + DD / Dd
+Striping	90%	
+Frosting	68%	
+Facial Mask	15%	
+Dorsal Stripe	35%	

Skewbald (Tobiano)	100%	TO / To (Dominant Tobiano Gene)
Piebald	...	EE / Ee + TO / To (Dominant Extension Gene & Dominant Tobiano Gene)
Tricoloured		AA / Aa + TO / To (Dominant Agouti Gene & Dominant Tobiano Gene)
etc...		<i>* All other Gene Combinations Apply!</i>
Sabino	80% /	SA / Sa (Dominant Sabino Gene)
White Sabino	55%	SA (Homozygous Sabino Gene)
Subtle Sabino	20% / x	Sa (Heterozygous Sabino Gene)
Body Spots	x / 25%	Sa (Heterozygous Sabino Gene)
Sabino Tobiano	x / 20%	SA / Sa + TO / To (Dominant Sabino Gene & Dominant Tobiano Gene)
Sabino Roan		SA / Sa + RR / Rr (Dominant Sabino Gene & Dominant Roan Gene)
Sabino Rabicano		SA / Sa + RRa (Dominant Sabino Gene & Dominant Rabicano Gene)
etc...	100% ...	<i>* All other Gene Combinations Apply!</i>
Overo	70%	Oo (Heterozygous Overo Gene)
Subtle Overo	30%	Oo (Heterozygous Overo Gene)
Ghost Overo (Lethal)	100%	OO (Homozygous Dominant Overo Gene)
Tovero	...	Oo + TO / To (Heterozygous Overo Gene & Dominant Tobiano Gene)
Sobero		Oo + SA / Sa (Heterozygous Overo Gene & Dominant Sabino Gene)
Overo Splash		Oo + SP / Sp (Heterozygous Overo Gene & Dominant Splashed Gene)
etc...		<i>* All other Gene Combinations Apply!</i>
Splashed White	80% /	SP / Sp (Dominant Splashed Gene)
Minimal	30%	Sp (Heterozygous Splashed Gene)
Splashed	x /	Sp (Heterozygous Splashed Gene)
Body Spots	50% x / 20%	<i>* All other Gene Combinations Apply!</i>

Varnish Roan	95% / 40%	VV / Vv (Dominant Varnish Roan Gene)
Subtle Varnish	x / 60%	* All other Gene Combinations Apply!
(Leopard Type 1)	100%	LL1 / LL1
Leopard	...	Vv + LL1 / LL1 (Heterozygous Varnish Roan & Dominant Leopard Type 1 Gene)
Fewspot		VV + LL1 / LL1 (Homozygous Varnish Roan & Dominant Leopard Type 1 Gene)
Hidden Leopard Type 1	80%	LL1 / LL1 (No Varnish Roan)
(Leopard Type 2)	100%	LL2 / LL2
Blanket	...	Vv + LL2 / LL2 (Heterozygous Varnish Roan & Dominant Leopard Type 2 Gene)
Snowcap		VV + LL2 / LL2 (Homozygous Varnish Roan & Dominant Leopard Type 1 Gene)
Hidden Leopard Type 2	80%	LL2 / LL2 (No Varnish Roan)
Pintaloosa	100%	VV / Vv + LL1 / LL1 // LL2 LL2 + TO / To // SA / Sa // OO / Oo // SP / Sp (Dominant Varnish Roan & Domiant Leopard Type 1/Type 2 Gene & Dominant Tobiano/Sabino/Overo/Splashed Gene)
(Brindle)		BBr / Bbr (Dominant Brindle Gene)
Dark Brindle	25% / 10%	
Light Brindle		
Hidden Brindle	75% / 90%	* All Gene Combinations Apply!

Marble	50% /	MM / Mm (Dominant Marble Gene)
Hidden Marble	25%	MM / Mm (Dominant Marble Gene)
Marble Tobiano	50% /	MM / Mm + TO / To (Dominant Marble Gene & Dominant Tobiano Gene)
Marble Sabino	75%	MM / Mm + SA / Sa (Dominant Marble Gene & Dominant Sabino Gene)
Marble Overo		MM / Mm + Oo (Dominant Marble Gene & Heterozygous Overo Gene)
Marble Splashed		
Marbled Leopard		
* All Gene Combinations Apply!		

Mutations:

Mutations are Genes that *do not originally exist* in the *Gene Pool*, but may *randomly appear* on any one horse. A mutated horse will be able to *pass on the mutated Gene*.

Pattern:	Chance of Mutation:	Genetic Requirements:	Genetic Results:
Brindle	1% 8%	ee // AA / Aa // GG / Gg (Chestnut, Bay or Grey Coloration) MM / Mm (Dominant Marble Gene) <i>*NO other Modifiers / Dilutions except for Silver & Flaxen!</i>	BBr / Bbr
Marble	15%	SA / Sa (Dominant Sabino Gene)	MM / Mm
Leg Marks	5% 10% 16% 16% 10% 12%	Ee (Heterozygous Black Coloration) ee (Chestnut Coloration) AA / Aa (Bay Coloration) AA / Aa + Ccr (Buckskin Coloration) ee + Ccr (Palomino Coloration) Sa (Heterozygous Sabino Gene) <i>*NO other Modifiers / Dilutions except for Flaxen, Sooty & Roan!</i>	LM / Lm

Face Marks	3%	Ee (<i>Heterozygous Black Coloration</i>)	FM / Fm
	8%	ee (<i>Chestnut Coloration</i>)	
	12%	AA / Aa (<i>Bay Coloration</i>)	
	12%	AA / Aa + Ccr (<i>Buckskin Coloration</i>)	
	8%	ee + Ccr (<i>Palomino Coloration</i>)	
	18%	Sa (<i>Heterozygous Sabino Gene</i>)	
		<i>*NO other Modifiers / Dilutions except for Flaxen, Sooty & Roan!</i>	
Grease Marks	68%	ee + Ss (<i>Recessive Extension Gene & Recessive Sooty Gene</i>)	GM / Gm
Birdcatcher Spots	20%	<i>*NO CCR, CC / Cc, PP / Pp, PA / Pa, RA / Ra, Pinto or Leopard!</i>	BC / Bc
Blue Eyes	10%	Misc. (<i>Blue Eyes Coloration</i>)	BE / Be

Chimerism:

Chimerism is purely based on chance, *Genetics* are of ***no consequence!***

Pattern:	Chance Of Mutation:
Marble Chimera:	1%
Stained Chimera:	1%

Markings:

Marking:	Percentage:	Genetic Structure:

Leg Markings (Any)	20%	LM + EE / Ee (Homozygous Leg Marks Gene & Dominant Extension Gene)
	50%	Lm + EE / Ee (Heterozygous Leg Marks Gene & Dominant Extension Gene)
	85%	LM / Lm + ee (Dominant Leg Marks Gene & Recessive Extension Gene)
	95%	LM / Lm + AA / Aa (Dominant Leg Marks Gene & Dominant Agouti Gene)
Face Markings (Any)	50%	FM + EE / Ee (Homozygous Face Marks Gene & Dominant Extension Gene)
	20%	Fm + EE / Ee (Heterozygous Face Marks Gene & Dominant Extension Gene)
	95%	FM / Fm + ee (Dominant Face Marks Gene & Recessive Extension Gene)
	85%	FM / Fm + AA / Aa (Dominant Face Marks Gene & Dominant Agouti Gene)
Stocking	35% / 10%	LM / Lm (Dominant Leg Marks Gene)
Sock	35% / 10%	LM / Lm (Dominant Leg Marks Gene)
Fetlock	20% / 25%	LM // Lm (Dominant Leg Marks Gene)
Pastern	x / 25%	Lm (Heterozygous Leg Marks Gene)
Coronet	x / 25%	Lm (Heterozygous Leg Marks Gene)
Partial Pastern	x / 5%	Lm (Heterozygous Leg Marks Gene)
		Lm + SA / Sa (Heterozygous Leg Marks Gene & Dominant Sabino Gene)
High White	10%	LM (Homozygous Dominant Leg Marks Gene)
	80%	LM + SA / Sa (Homozygous Dominant Leg Marks Gene & Dominant Sabino Gene)
	12%	Lm + SA / Sa (Heterozygous Leg Marks Gene & Dominant Sabino Gene)
	5%	SA / Sa (Dominant Sabino Gene)
Irregular	35%	LM / Lm + SA / Sa (Dominant Leg Marks Gene & Dominant Sabino Gene)
	25%	LM / Lm + Oo (Dominant Leg Marks Gene & Heterozygous Overo Gene)
Blaze	45% / 20%	FM / Fm (Dominant Face Marks Gene)
Strip	45% / 35%	FM / Fm (Dominant Face Marks Gene)
Star	x / 20%	Fm (Heterozygous Face Marks Gene)
Snip	x / 15%	Fm (Heterozygous Face Marks Gene)
Interrupted	10% / 10%	FM / Fm (Dominant Face Marks Gene)
Lip Markings		FM / Fm + SA / Sa (Dominant Face Marks Gene & Dominant Sabino Gene)
Bald Face	8%	FM + TO / To // SA / Sa (Homozygous Face Marks Gene & Tobiano or Sabino)
Medicine Hat	6%	FM / Fm + TO / To // SA / Sa (Dominant Face Marks Gene & Tobiano or Sabino)
Crooked	10%	FM / Fm (Dominant Face Marks Gene)
	15%	(Interrupted Face Marking)
	18%	FM / Fm + SA / Sa // Oo (Dominant Face Marks Gene & Sabino or Overo Gene)

Grease Marks	15%	ee + Ss (<i>Recessive Extension Gene & Recessive Sooty Gene</i>)
	80%	ee + GM / Gm (<i>Recessive Extension Gene & Greese Marks Gene</i>)
Ermine	18%	LM / Lm (<i>Dominant Leg Marks Gene</i>)
	8%	TO / To // SA / Sa // Oo (<i>Tobiano, Sabino or Overo Gene</i>)
Body Spots	20%	Ww (<i>Heterozygous White Gene</i>)
	20%	Sa (<i>Heterozygous Sabino Gene</i>)
	20%	Sp (<i>Heterozygous Splashed Gene</i>)
Birdcatcher Spots	75%	BC / Bc (<i>Dominant Birdcatcher Gene</i>)

Eye Colour:

Eye Colour:	Percentage:	Genetic Structure:
Black	25%	Misc. (<i>All Other Gene Combinations!</i>)
Brown	40%	
Golden Brown	16%	
Amber	6%	
Hazel	8%	
Green	3%	
Blue	2%	
Heterochromia Golden	5%	Misc. (<i>All Other Gene Combinations!</i>)
Heterochromia Amber	3%	
Heterochromia Hazel	2%	
Heterochromia Green	1%	
Heterochromia Blue	1%	
Amber	30% / 40%	CC / Cc (<i>Dominant Champagne Gene</i>)
	30%	PP / Pp (<i>Dominant Pearl Gene</i>)
Hazel	30% / 60%	CC / Cc (<i>Dominant Champagne Gene</i>)
	70%	PP / Pp (<i>Dominant Pearl Gene</i>)

Green	30%	CC (<i>Homozygous Champagne Gene</i>)
	80%	CC / Cc + PP / Pp (<i>Dominant Champagne Gene & Dominant Pearl Gene</i>)
	80%	CC / Cc + CCR / Ccr (<i>Dominant Champagne Gene & Dominant Pearl Gene</i>)
	80%	Ccr + PP / Pp (<i>Heterozygous Cream Gene & Dominant Pearl Gene</i>)
Sea Green	10%	CC (<i>Homozygous Champagne Gene</i>)
	20%	CC / Cc + PP / Pp (<i>Dominant Champagne Gene & Dominant Pearl Gene</i>)
	20%	CC / Cc + CCR / Ccr (<i>Dominant Champagne Gene & Dominant Pearl Gene</i>)
	20%	Ccr + PP / Pp (<i>Heterozygous Cream Gene & Dominant Pearl Gene</i>)
Blue	80%	BE / Be (<i>Dominant Blue Eye Gene</i>)
	90%	WW / Ww (<i>Dominant White Gene</i>)
	85%	CCr + PP / Pp (<i>Homozygous Cream Gene & Dominant Pearl Gene</i>)
	80%	CC + PP / Pp (<i>Homozygous Champagne Gene & Dominant Pearl Gene</i>)
	98%	OO / Oo (<i>Dominant Overo Gene</i>)
	98%	SSP / Ssp (<i>Dominant Splashed Gene</i>)
Violet		BE / Be (<i>Dominant Blue Eye Gene</i>)
	10%	WW / Ww (<i>Dominant White Gene</i>)
	3%	CCr + PP / Pp (<i>Homozygous Cream Gene & Dominant Pearl Gene</i>)
	2%	CC + PP / Pp (<i>Homozygous Champagne Gene & Dominant Pearl Gene</i>)
	1%	OO / Oo (<i>Dominant Overo Gene</i>)
	1%	SSP / Ssp (<i>Dominant Splashed Gene</i>)
	1%	
	1%	
White Sclera	90%	VR / Vr (<i>Dominant Varnish Roan Gene</i>)

Hooves:

Coloration/Pattern:	Percentage:	Genetic Structure:
<i>*On Colored Base!</i>		
Black		EE / Ee
		AA / Aa
		AA / Aa + Ccr
		EE / Ee + GG / Gg
		*All Additive Gene Mixes Except For: Chestnut, Cream, Champagne, Pearl.
Dark		EE / Ee
		ee
		AA / Aa

Tan	<p>GG / Gg</p> <p>ee + SS / Ss</p> <p>AA / Aa + SS / Ss</p> <p>*All Additive Gene Mixes Except For: <i>Perlino, Cremello, Champagne, Pearl.</i></p>
Honey	<p>EE / Ee</p> <p>ee</p> <p>AA / Aa</p> <p>GG / Gg</p> <p>ee + Ccr</p> <p>*All Additive Gene Mixes Except For: <i>Perlino, Cremello, Champagne, Pearl.</i></p>
Gray	<p>ee</p> <p>AA / Aa</p> <p>GG / Gg</p> <p>Ccr</p> <p>CCR</p> <p>CC</p> <p>PP</p> <p>*All Other Additive Gene Mixes, No Black.</p>
Cream	<p>EE / Ee</p> <p>ee</p> <p>AA / Aa</p> <p>GG / Gg</p> <p>Ccr</p> <p>CCR</p> <p>CC</p> <p>PP</p> <p>*All Other Additive Gene Mixes, No Black.</p> <p>ee</p> <p>AA / Aa</p> <p>GG / Gg</p> <p>Ccr</p> <p>CCR</p> <p>CC</p> <p>PP</p> <p>*All Other Additive Gene Mixes, No Black.</p>

*On White Marking!		
Tan		
Honey		
Gray		
Cream		
Striped Var. 1	10%	(Ermine Markings)
	65%	VN / Vn // LL1 / Ll1 // LL2 / Ll2 (<i>Varnish Roan, Leopard 1 or Leopard 2 Gene</i>)
Striped Var. 2	70%	(Ermine Markings)
	35%	VN / Vn // LL1 / Ll1 // LL2 / Ll2 (<i>Varnish Roan, Leopard 1 or Leopard 2 Gene</i>)
Mottled		

Coat Layers:

Horse coats are broken down into **Texture Layers** applied on top of each other adhering to the following **logical structure**, where each column represents it's own **Layer**:

Base Layer:	Notes:
Black	
Chestnut	
Optional Layers:	
Bay	
Grey	

Buckskin	
Palomino	
Perlino	
Cremello	
Champagne	
Pearl	
Flaxen	
Silver	
White	
Sooty	
Pangare	
Dun	
Roan	
Rabicano	
Tobiano	
Overo	
Sabino	
Splash	
Varnish Roan	
Leopard	
Fewspot	
Blanket	
Snowcap	

Stocking Sock Fetlock Pastern Coronet Partial Pastern High White	
Stocking Sock Fetlock Pastern Coronet Partial Pastern High White	
Stocking Sock Fetlock Pastern Coronet Partial Pastern High White	
Stocking Sock Fetlock Pastern Coronet Partial Pastern High White	

Blaze	
Strip	
Bald Face	
Medicine Hat	
Crooked	
Star	
Snip	
Lip Markings	
Star	
Snip	
Lip Markings	
Grease Spots	
Ermine	
Body Spots	
Birdcatcher Spots	
Hooves	
Sclera	
Black	
Brown	
Amber	
Green	
Blue	

(Empty Columns are just for legibility!)

*Colors in the **Same Column** are **Mutually Exclusive!**

Anatomy Mesh:

A mix between 2 Breeds will create an "average" of the 2 Body Shapes Combined.