

Table S1 the correlation coefficients and the other descriptive statistics of six backfat thickness traits.

	BF1	BF2	BF3	BF4	BF5	BF6
BF1	27.16±4.12 mm	<0.001	<0.001	<0.001	<0.001	<0.001
BF2	0.51	18.58±4.85 mm	<0.001	<0.001	<0.001	<0.001
BF3	0.54	0.77	16.51±4.46 mm	<0.001	<0.001	<0.001
BF4	0.46	0.64	0.70	16.56±3.96 mm	<0.001	<0.001
BF5	0.47	0.53	0.56	0.55	16.00±4.31 mm	<0.001
BF6	0.79	0.69	0.74	0.82	0.84	19.91±3.36 mm

Note: The lower and upper triangle is the correlation coefficient and its p-value, respectively. The diagonal is the mean and standard deviation of all individual phenotypes of the Yorkshire pigs.

Table S2 a list of candidate regions revealed by iHS method.

Chr.	Position (bp)	p_value	Genes	Function
1	74139330-74181165	0.007	<i>OSTM1</i>	Osteoclast Maturation [1]
2	89855166-89905197	<0.001	<i>ACOT12</i>	Fat metabolism [2]
4	93218072-93234226	0.003	<i>NTRK1</i>	Nerve Growth Factor [3]
4	33811284-33843294	0.006	<i>FZD6</i>	Hair development [4]
6	77161479-77267417	0.007	<i>PAX7</i>	Skeletal muscles [5]
7	30320414-30329408	0.008	<i>HMGAI</i>	Growth and fat deposition traits [6]
7	64140697-64375535	0.010	<i>RALGAP1</i>	Skeletal muscle [7]
8	102213138-102266309	0.009	<i>BBS7</i>	Embryonic development [8]
9	41067491-41135271	0.004	<i>DRD2</i>	Pigmentation [9], Fertility [10]
9	89341141-89450696	0.004	<i>ITGB8</i>	Pregnant gilts [11]

Table S3 summary and annotation of the SNPs associated with backfat thickness in Yorkshire pigs.

Category	BF1	BF2	BF3	BF4	BF5	BF6
Method	XPEHH (F _{ST})	XPEHH (F _{ST})	XPEHH (F _{ST})	XPEHH (F _{ST})	XPEHH (F _{ST})	XPEHH (F _{ST})
Number of outliers	126 (94)	75 (38)	50 (29)	128 (47)	27 (24)	60 (51)
Upstream	-	-	-	-	0 (1)	-
UTR5	-	-	-	-	-	-
Exonic	1 (2)	0 (1)	0 (1)	2 (2)	0 (3)	0 (4)
Intronic	49 (26)	20 (12)	4 (9)	51 (16)	10 (9)	19 (21)
UTR3	1 (1)	2 (0)	-	2 (1)	-	-
Downstream	-	-	-	-	-	0 (1)
Intergenic	75 (65)	53 (25)	46 (19)	73 (28)	17 (11)	41 (25)

Table S4 the summary of significant selection signatures for six backfat thickness traits.

		BF1	BF2	BF3	BF4	BF5	BF6
1st population pair	XPEHH;	371;	369;	369;	370;	370;	370;
	F _{ST}	371	371	370	370	370	370
2nd population pair	XPEHH;	371;	369;	369;	370;	370;	370;
	F _{ST}	370	371	371	372	372	371
3rd population pair	XPEHH;	370;	370;	370;	371;	370;	370;
	F _{ST}	374	370	372	376	370	371
Common Selection Signatures²	XPEHH;	129;	108;	71;	132;	37;	65;
	F _{ST}	95	42	30	48	27	54
Trait-specific Selection Signatures³	XPEHH;	126;	75;	50;	128;	27;	60;
	F _{ST}	94	38	29	47	24	51

Table S5 the results of GO analysis and pathway analysis.

See Supplementary Table S5.xlsx

Table S6 QTLs overlapped with the trait-specific selection signatures identified by F_{ST} and XPEHH simultaneously.

Chr.	Position(bp)	XPEHH (F_{ST}) Scores	Trait, Direction	QTL Name
1	75034459-75999912	0.34<0.35<0.73 (0.06<0.07<0.12)	BF6, Low	Intermuscular fat content QTL;
1	270659255-271411666	0.44<0.59<0.80 (0.06<0.09<0.13)	BF1, Low	Drip loss QTL;
2	119980473-120922605	0.44<0.57<0.62 (0.05<0.12<0.23)	BF1, Low	Average daily gain QTL;
6	40436890-41163330	0.33<0.44<0.79 (0.03<0.05<0.18)	BF3, Low	Fat weight (total) QTL; Belly weight QTL; Drip loss QTL; pH 45 minutes post mortem QTL; Average daily gain QTL; Loin muscle area QTL; Intramuscular fat content QTL
10	10868180-11462923	0.37<0.50<0.65 (0.08<0.16<0.18)	BF1, Low	Intramuscular fat content QTL; pH 45 minutes post mortem QTL; Triglyceride level QTL; Average backfat thickness QTL; Eicosapentaenoic acid content QTL;
14	98219317-98841746	0.28<0.35<0.57 (0.03<0.06<0.12)	BF2, Low	mummified pigs QTL;
15	115418643-116218447	0.50<0.65<0.79 (0.06<0.09<0.16)	BF1, Low	Skin thickness QTL;
12	57219422-57749302	-0.35>-0.41>-0.52 (0.07<0.10<0.20)	BF3, High	Fat weight (total) QTL; Obesity index QTL; Intramuscular fat content QTL; Marbling QTL; Muscle moisture percentage QTL; Meat color L* QTL; PH for Longissimus dorsi QTL;
13	173585408-176112123	-0.31>-0.44>-0.79 (0.04<0.05<0.13)	BF6, High	mummified pigs QTL; Body weight (birth) QTL;
15	4257226-5665872	-0.46>-0.60>-0.62 (0.05<0.10<0.13)	BF1, High	Days to 110 kg QTL; Intramuscular fat content QTL; Average backfat thickness QTL;
15	128164437-128661043	-0.50>-0.52>-0.74 (0.07<0.10<0.14)	BF1, High	Feed conversion ratio QTL
17	19479617-20272227	-0.34>-0.39>-0.61 (0.05<0.07<0.18)	BF1, High	Shear force at first peak QTL; Backfat between 3rd and 4th last ribs QTL
17	21239488-25085047	-0.37>-0.42>-0.75 (0.07<0.074<0.20)	BF2, High	Palmitic acid content QTL; Myristic acid content QTL; Eicosenoic acid to eicosanoic acid ratio QTL; Backfat between 3rd and 4th last ribs QTL

Table S7 the summary of XPEHH scores for trait-specific selection signatures.

	BF1	BF2	BF3	BF4	BF5	BF6
Low backfat thickness subpopulation (+)	73	59	41	58	8	48
High backfat thickness subpopulation (-)	53	16	9	70	9	12

Note: “+” and “-” indicated that selection signatures were detected in low and high backfat thickness subpopulations, respectively.

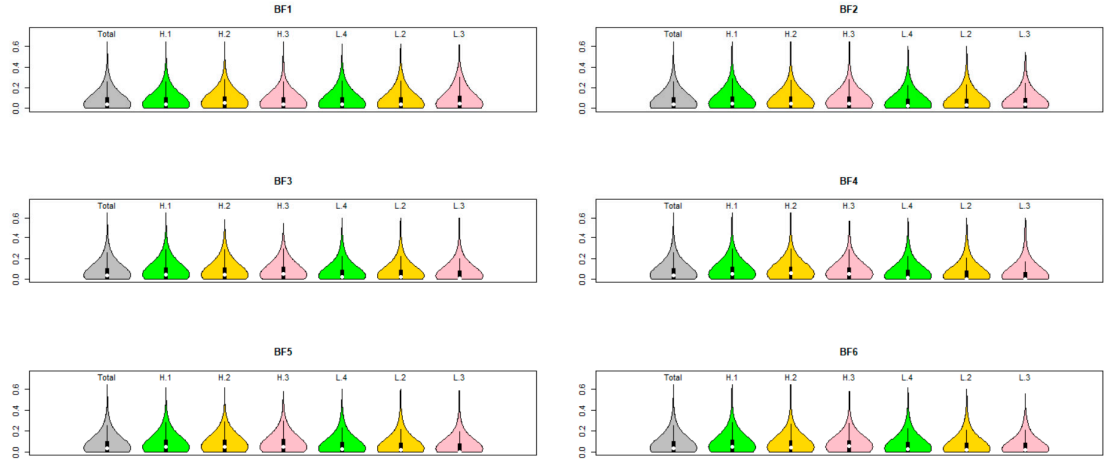


Figure S1 The violin plot of expected heterozygosity in each subpopulation for backfat thickness traits. Total represents the source Yorkshire population, H.1 (H.2, H.3) and L.1 (L.2, L.3) represents the two subpopulations of 1st (2nd, 3rd) population pair.

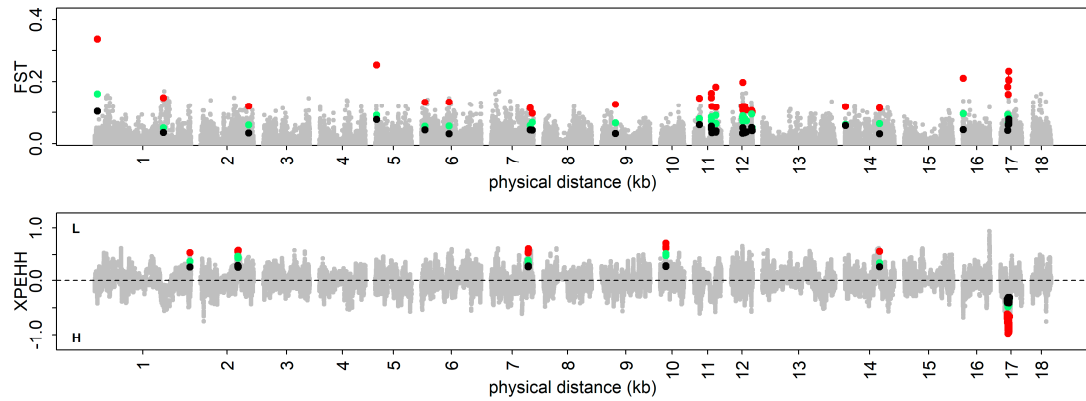


Figure S2 Visualization of trait-specific selection signatures for backfat between 6th and 7th thoracic vertebrae (BF2). The colored dots indicate the trait-specific selection signatures. The black (green, red) dots indicate the selection signatures identified in 1st (2nd, 3rd) population pair.

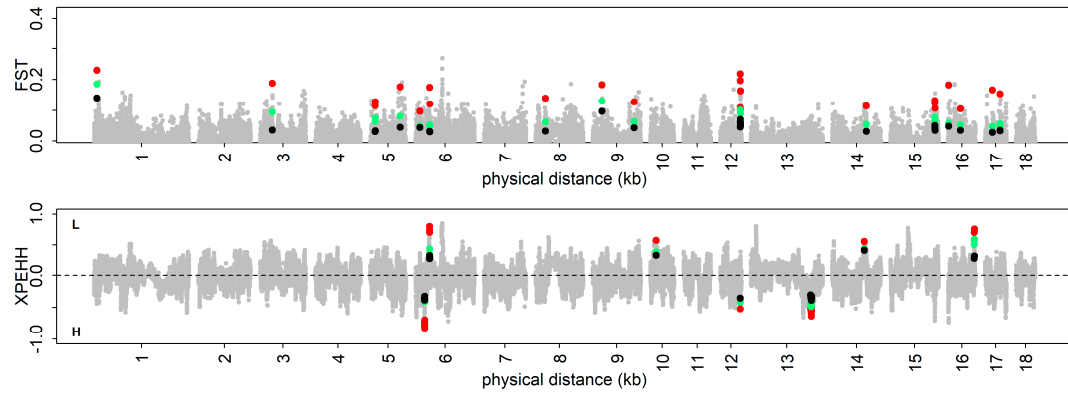


Figure S3 Visualization of trait-specific selection signatures for backfat at tenth rib (BF3). The colored dots indicate the trait-specific selection signatures. The black (green, red) dots indicate the selection signatures identified in 1st (2nd, 3rd) population pair.

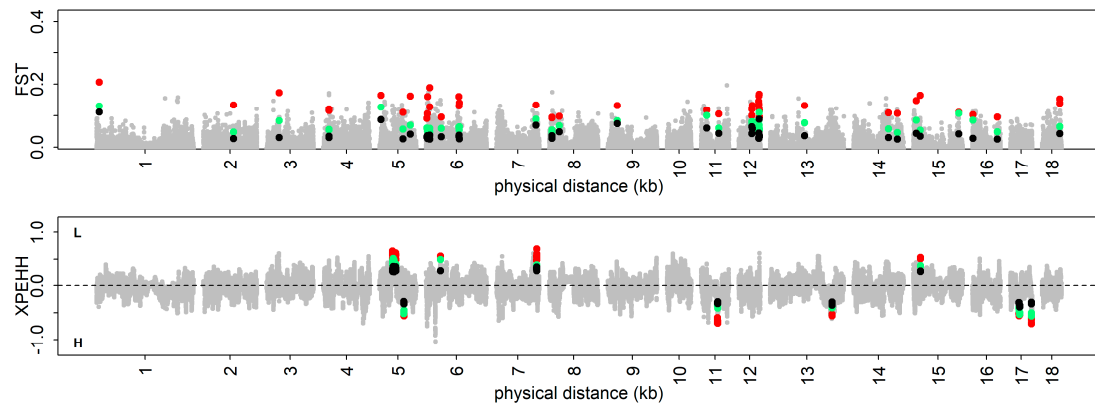


Figure S4 Visualization of trait-specific selection signatures for backfat at thoracolumbar junction (BF4). The colored dots indicate the trait-specific selection signatures. The black (green, red) dots indicate the selection signatures identified in 1st (2nd, 3rd) population pair.

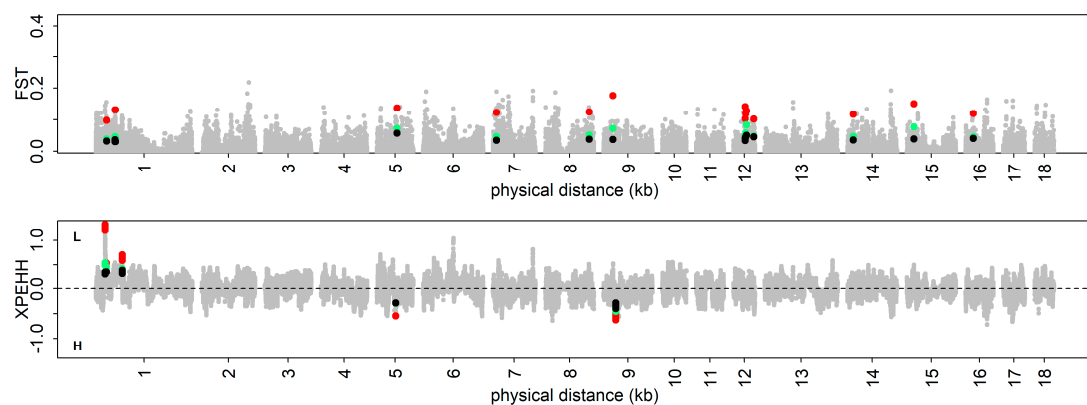


Figure S5 Visualization of trait-specific selection signatures for backfat at waist recommended vertebral junction (BF5). The colored dots indicate the trait-specific selection signatures. The black (green, red) dots indicate the selection signatures identified in 1st (2nd, 3rd) population pair.

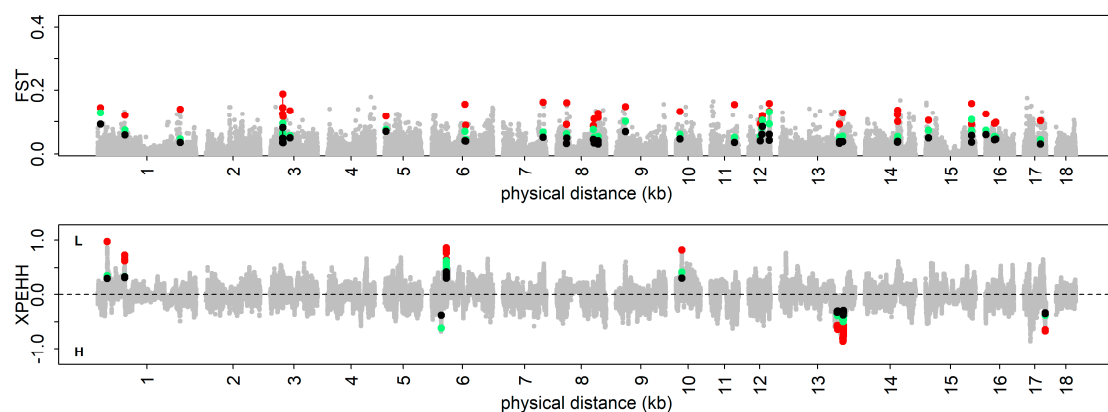


Figure S6 Visualization of trait-specific selection signatures for the average backfat thickness of 3 points (BF6). The colored dots indicate the trait-specific selection signatures. The black (green, red) dots indicate the selection signatures identified in 1st (2nd, 3rd) population pair.

References

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