

**Table S1.** Detailed information on 25 fatty acids present in IMF of the *longissimus dorsi* of Ningxiang pigs.

Substance Name	N	Relative Content ( $\pm$ SE) (%)
IMF	691	3.65 ( $\pm$ 0.04)
(Intramuscular fat)		
SFA	691	39.35 ( $\pm$ 0.38)
(Saturated fat acid)		
C10:0 <sup>#</sup>	279	0.24 ( $\pm$ 0.005)
(Capric)		
C12:0 <sup>#</sup>	428	0.12 ( $\pm$ 0.002)
(Lauric acid)		
C14:0	649	1.42 ( $\pm$ 0.01)
(Myristic acid)		
C15:0 <sup>#</sup>	132	0.04 ( $\pm$ 0.002)
(Myristic oleic acid)		
C16:0	651	26.38 ( $\pm$ 0.06)
(Palmitic acid)		
C17:0	645	0.15 ( $\pm$ 0.001)
(Margaric acid)		
C18:0	651	13.42 ( $\pm$ 0.06)
(Stearic acid)		
C20:0	649	0.21 ( $\pm$ 0.002)
(Arachidic acid)		
C22:0 <sup>#</sup>	161	0.10 ( $\pm$ 0.004)
(Behenic acid)		
C23:0 <sup>#</sup>	201	0.17 ( $\pm$ 0.01)
(Tricosanoic acid)		
C24:0 <sup>#</sup>	191	0.20 ( $\pm$ 0.01)
(Lignoceric acid)		
MUFA	691	41.88 ( $\pm$ 0.42)
(Monounsaturated fat acid)		
C14:1 <sup>#</sup>	80	0.04 ( $\pm$ 0.12)
(Myristoleic acid)		
C16:1	650	3.28 ( $\pm$ 1.03)
(Palmitoleic acid)		
C17:1 <sup>#</sup>	66	0.10 ( $\pm$ 0.004)
(Margaroleic acid)		
C18:1n-9(t)	627	0.11 ( $\pm$ 0.001)
(Elaidic acid)		
C18:1n-9(c)	651	40.28 ( $\pm$ 0.12)
(Oleic acid)		
C20:1	650	0.80 ( $\pm$ 0.01)
(Eicosenoic acid)		
PUFA	691	12.78 ( $\pm$ 0.18)
(Polyunsaturated fatty acid)		
C18:2n-6(c)	651	10.12 ( $\pm$ 0.10)
(Linoleic acid)		
C18:3n-3	572	0.36 ( $\pm$ 0.01)
( $\alpha$ -Linolenic acid---ALA)		
C18:3n-6 <sup>#</sup>	220	0.07 ( $\pm$ 0.02)

( $\gamma$ -Linolenic acid---GLA)		
C20:2	649	0.33 ( $\pm$ 0.03)
(Eicosa-11,14-dienoic acid)		
C20:3n-3 <sup>#</sup>	151	0.09 ( $\pm$ 0.02)
(Dihomo- $\alpha$ -linolenic acid)		
C20:3n-6	647	0.38 ( $\pm$ 0.01)
(Dihomo- $\gamma$ -linolenic acid)		
C20:4n-6	649	2.42 ( $\pm$ 0.04)
(Arachidonic acid)		
C22:6n-3 <sup>#</sup>	64	0.09 ( $\pm$ 0.01)
(Docosaheptaenoic acid---DHA)		

N represents the number of individuals with this fatty acid detected in the population; relative content represents the mean value of the content, and SE represents the standard error; the “#” indicates the FA was removed due to a lower individual (N < 533).

**Table S2.** Genome-wide significant SNPs loci for SFAs, MUFAs and PUFAs in Ningxiang pigs.

Fatty acid	SNP	CHR	POS (bp)	MAF <sup>1</sup>	<i>p</i> -value	PVE (%) <sub>2</sub>	Nearest gene <sup>3</sup>	Location
C14:0	WU_10.2_3_116903421	3	116,903,421	0.10	$2.15 \times 10^{-7}$	2.98	<i>ALK</i>	Intronic
	H3GA0053711	10	19,975,279	0.39	$1.10 \times 10^{-7}$	4.21	<i>HNRNPU</i>	Intergenic
	ASGA0074106	16	75,024,639	0.20	$1.43 \times 10^{-6}$	6.30	<i>MFAP3</i>	Intronic
C16:0	ALGA0020228	3	102,155,060	0.27	$3.04 \times 10^{-8}$	0.96	<i>CAMKMT</i>	Intergenic
	WU_10.2_4_119395133	4	119,395,133	0.20	$7.24 \times 10^{-7}$	0.71	<i>CEPT1</i>	Intronic
	ASGA0027821	6	20,665,813	0.08	$1.66 \times 10^{-6}$	1.87	---	Intergenic
	MARC0001638	9	20,050,249	0.38	$3.49 \times 10^{-9}$	1.54	---	Intergenic
	M1GA0024654	12	23,711,351	0.25	$2.83 \times 10^{-8}$	1.49	<i>NPEPPS</i>	Intronic
	ASGA0053936	12	28,196,313	0.10	$9.35 \times 10^{-7}$	2.46	<i>CA10</i>	Intergenic
	ALGA0071522	13	101,058,816	0.48	$1.60 \times 10^{-7}$	0.92	<i>P2RY1 / RAP2B</i>	Intergenic
	WU_10.2_3_142168876	3	142,168,876	0.22	$3.47 \times 10^{-7}$	1.63	<i>ENSSSCG00000008655</i>	Intronic
C17:0	WU_10.2_4_89693248	4	89,693,248	0.13	$1.09 \times 10^{-6}$	0.98	<i>ATP1B1 / DPT</i>	Intergenic
	ALGA0040777	7	41,624,144	0.44	$2.75 \times 10^{-8}$	1.06	<i>ENSSSCG00000027922</i>	Intergenic
	WU_10.2_12_7644839	12	7,644,839	0.02	$1.40 \times 10^{-7}$	5.94	<i>SDK2</i>	Intergenic
	ASGA0059505	13	191,280,771	0.01	$4.53 \times 10^{-8}$	11.39	<i>ENSSSCG00000012009</i>	Intergenic
	ASGA0097154	16	38,383,883	0.35	$1.23 \times 10^{-6}$	0.74	<i>MIER3 / GPBP1</i>	Intergenic
	ALGA0010606	1	302,716,687	0.02	$1.05 \times 10^{-8}$	5.30	<i>SWI5</i>	3 prime UTR
	WU_10.2_11_3591593	11	3,591,593	0.45	$1.78 \times 10^{-7}$	0.96	<i>CDK8</i>	Intronic
	DRGA0011206	11	45,910,375	0.02	$5.51 \times 10^{-8}$	6.85	<i>KLHL1</i>	Intergenic
C18:0	WU_10.2_14_106229446	14	106,229,446	0.09	$5.06 \times 10^{-12}$	6.06	<i>DKK1 / PRKG1</i>	Intergenic
	ALGA0080940	14	118,552,421	0.30	$3.94 \times 10^{-9}$	1.79	<i>AVPI1</i>	Intronic
	WU_10.2_2_19459316	2	19,459,316	0.01	$3.53 \times 10^{-10}$	0.50	<i>U5 / EXT2</i>	Intergenic
	MARC0046666	2	99,366,616	0.10	$1.11 \times 10^{-6}$	0.04	<i>MEF2C</i>	Intergenic
	WU_10.2_3_13474115	3	13,474,115	0.17	$9.65 \times 10^{-7}$	0.03	<i>SNORA79</i>	Intergenic
	ALGA0025658	4	75,387,791	0.03	$1.21 \times 10^{-8}$	2.18	<i>ARMC1</i>	Intergenic
	DRGA0005776	5	46,748,561	0.01	$9.76 \times 10^{-18}$	0	<i>IPO8</i>	Intergenic
	H3GA0016783	5	71,996,403	0.36	$9.65 \times 10^{-16}$	0.12	<i>IL17RA / CECR2</i>	Upstream gene
C20:0	WU_10.2_5_102656712	5	102,656,712	0.01	$1.17 \times 10^{-6}$	0.19	---	---
	WU_10.2_7_6641603	7	6,641,603	0.06	$1.79 \times 10^{-6}$	0.04	<i>OFCC1</i>	Intergenic
	MARC0077077	7	90,165,851	0.03	$1.22 \times 10^{-8}$	0.02	<i>U4</i>	---
	ALGA0047587	8	36,220,598	0.01	$1.33 \times 10^{-17}$	89.85	---	---
	ALGA0049475	8	58,905,523	0.02	$1.57 \times 10^{-9}$	0.38	<i>TMEM165 / REST</i>	---
	WU_10.2_13_7954310	13	7,954,310	0.02	$1.07 \times 10^{-6}$	0.13	<i>EFHB / PP2D1</i>	Intergenic
	H3GA0041501	14	98,921,568	0.37	$4.07 \times 10^{-7}$	0.02	<i>ALOX5</i>	Intronic
	MARC0054269	16	33,826,642	0.45	$5.43 \times 10^{-9}$	0.04	<i>ITGA1</i>	Intronic
	WU_10.2_16_59778879	16	59,778,879	0.12	$3.17 \times 10^{-14}$	0.48	<i>SLIT3</i>	Intronic
	ASGA0073724	16	65,860,356	0.38	$1.45 \times 10^{-10}$	0.06	---	---
	ALGA0004246	1	80,989,471	0.19	$1.47 \times 10^{-6}$	8.55	<i>PREP</i>	Intergenic
	MARC0099145	11	7,302,533	0.26	$3.19 \times 10^{-7}$	2.20	<i>ALOX5AP / MEDAG</i>	Intergenic
	ALGA0081341	14	127,218,925	0.42	$5.58 \times 10^{-7}$	2.81	<i>U6</i>	Intergenic
	ALGA0015731	2	132,199,278	0.37	$6.33 \times 10^{-7}$	0.67	<i>PRDM6</i>	Intronic
C18:1n-9(c)	WU_10.2_7_113985448	7	113,985,448	0.337	$1.41 \times 10^{-6}$	1.67	<i>FLRT2</i>	Intergenic
	ASGA0064960	14	77,566,009	0.34	$9.97 \times 10^{-7}$	0.41	<i>RUFY2</i>	Intronic
	H3GA0012422	4	31,763,547	0.02	$4.00 \times 10^{-8}$	0.73	<i>RSPO2</i>	Intergenic
C18:1n-9(t)	DIAS0004691	7	29,798,220	0.02	$5.20 \times 10^{-8}$	1.37	<i>RXR8 / COL11A2</i>	Downstream gene
	ASGA0033619	7	52,577,418	0.02	$9.68 \times 10^{-7}$	0.52	<i>MCM3 / PAQR8</i>	---

	H3GA0025990	9	2,779,787	0.01	$4.13 \times 10^{-10}$	2.69	SYT9	Intronic
	ALGA0079386	14	91,261,955	0.29	$6.50 \times 10^{-7}$	0.26	NRG3 / SNORA31	Intergenic
	H3GA0046208	16	22,351,887	0.01	$1.46 \times 10^{-11}$	45.24	CAPSL	Intronic
	DRGA0016063	16	32,872,449	0.04	$1.06 \times 10^{-13}$	31.52	ISL1	Intergenic
	ASGA0004095	1	113,473,890	0.24	$4.76 \times 10^{-7}$	0.79	ENSSSCG0000000452 7	Intergenic
	ASGA0085560	3	26,316,304	0.36	$2.27 \times 10^{-8}$	1.43	GP2 / GPR139	Intergenic
C20:1	WU_10.2_5_13180559	5	13,180,559	0.38	$2.03 \times 10^{-9}$	0.85	CRY1	Intronic
	ASGA0031521	7	17,152,543	0.02	$7.91 \times 10^{-9}$	6.73	CDKAL1	---
	7_134762912	7	134,762,912	0.26	$6.37 \times 10^{-11}$	1.67	SCARNA6	Intergenic
	ALGA0111031	8	41,395,488	0.25	$1.91 \times 10^{-6}$	2.27	USP46	Intergenic
	ASGA0059943	13	210,282,758	0.10	$4.97 \times 10^{-7}$	0.82	CLDN14 / SIM2	Intergenic
	H3GA0047778	17	7,610,059	0.03	$1.62 \times 10^{-7}$	3.49	---	---
C18:2n-6(c)	ALGA0015731	2	132,199,278	0.37	$1.99 \times 10^{-7}$	2.10	CEP120	Intronic
	WU_10.2_5_24153921	5	24,153,921	0.02	$1.45 \times 10^{-11}$	18.22	RDH16 / NDUFA4L2	Intergenic
	ASGA0085192	16	76,899,854	0.05	$5.47 \times 10^{-7}$	6.33	ENSSSCG0000001707 7	Intergenic
	MARC0014875	5	26,784,432	0.01	$1.52 \times 10^{-9}$	21.92	SLC16A7	Intergenic
C18:3n-3	ALGA0111381	9	14,991,770	0.02	$6.15 \times 10^{-8}$	5.51	ssc-mir-708	Intergenic
	DRGA0009320	9	37,972,729	0.08	$3.28 \times 10^{-9}$	16.44	ENSSSCG0000001499 3	Intronic
	ASGA0060681	14	5,504,363	0.42	$8.41 \times 10^{-7}$	1.53	SNORA25	Intergenic
C20:2	ALGA0004743	1	96,303,394	0.08	$4.70 \times 10^{-7}$	10.78	ENSSSCG0000002237 9	Intergenic
	WU_10.2_2_7173969	2	7,173,969	0.23	$6.35 \times 10^{-10}$	2.14	FLRT1	Intronic
	WU_10.2_2_9630034	2	9,630,034	0.19	$6.76 \times 10^{-7}$	2.15	SDHAF2	Missense
C20:3n-6	ALGA0106081	2	12,459,648	0.18	$7.40 \times 10^{-8}$	1.62	ENSSSCG0000002294 3	Upstream gene
	ASGA0039809	8	130,628,617	0.18	$1.18 \times 10^{-9}$	1.84	EIF4E	Intronic
	ALGA0115480	13	187,857,350	0.11	$1.14 \times 10^{-7}$	1.57	ROBO2	Intergenic
	ALGA0031262	5	23,686,043	0.01	$2.71 \times 10^{-16}$	31.76	PTGES3	Intronic
C20:4n-6	WU_10.2_9_42529952	9	42,529,952	0.02	$2.28 \times 10^{-10}$	7.56	C11orf87 / U1	Intergenic
	WU_10.2_13_194176619	13	194,176,619	0.22	$1.73 \times 10^{-6}$	1.20	U6	Intergenic

<sup>1</sup>MAF: minor allelic frequency;

<sup>2</sup>PVE: explained phenotype variance;

<sup>3</sup> The nearest genes are the closest genes within 500kb upstream and downstream of the significant SNP.