

Table S1 The effect of thoracic vertebral number on carcass length and carcass weight

TVN	No.	CL(cm)	CW(kg)
12	17	70.836±1.300 ^A	24.129±1.589 ^a
13	571	72.105±0.724 ^A	24.174±0.884 ^a
14	36	74.212±0.989 ^B	24.627±1.209 ^a

TVN, thoracic vertebral number; CL, carcass length; CW, carcass weight; Phenotypic values are shown in estimated marginal means ± standard error. Values with different superscript capital letters in the same column are highly significantly different ($p \leq 0.01$). Values with same superscript lowercase letters in the same column are not significantly different ($p > 0.05$)

Table S2 The effect of lumbar vertebral number on carcass length and carcass weight

LVN	No.	CL(cm)	CW(kg)
5	77	71.237±0.863 ^a	23.706±1.051 ^a
6	547	72.507±0.720 ^b	24.309±0.877 ^a

LVN, lumbar vertebral number; CL, carcass length; CW, carcass weight; Phenotypic values are shown in estimated marginal means ± standard error. Values with different superscript lowercase letters in the same column are significantly different ($p \leq 0.05$). Values with same superscript lowercase letters in the same column are not significantly different ($p > 0.05$)

Table S3 The effect of vertebral formulae on carcass weight and carcass length

VF	No.	CL(cm)	CW(kg)
T12L6	17	70.848±1.296 ^{ab}	24.135±1.589 ^a
T13L5	77	71.108±0.860 ^{bA}	23.682±1.054 ^a
T13L6	494	72.284±0.727 ^{ac}	24.262±0.891 ^a
T14L6	36	74.209±0.987 ^{dB}	24.626±1.209 ^a

VF, vertebral formulae; T12L6, 12 thoracic and 6 lumbar vertebrae; T13L5, 13 thoracic and 5 lumbar vertebrae; T13L6, 13 thoracic and 6 lumbar vertebrae; T14L6, 14 thoracic and 6 lumbar vertebrae. CL, carcass length; CW, carcass weight; Phenotypic values are shown in estimated marginal means ± standard error. Values with different superscript lowercase letters in the same column are significantly different ($p \leq 0.05$), and Values with different superscript capital letters in the same column are highly significantly different ($p \leq 0.01$).

Table S4 The mutations in VRTN gene

SNP Identifier	SNP ID(dbSNP)	Chr:bp**	Alleles	Function
SNP256	rs602874467	7:82533570	G/T	synonymous
SNP347	rs413788795	7:82533661	C/T	synonymous
SNP394	rs599909970	7:82533708	G/T	synonymous
SNP415	rs423107755	7:82533729	A/G	synonymous
SNP898	rs602768677	7:82533904	A/C	missense
SNP1029	rs596082307	7:82534035	C/T	synonymous
SNP1259	rs426367238*	7:82534266	C/G	synonymous
SNP1377	rs429465892	7:82534383	C/T	synonymous
SNP1708	rs428776549	7:82534714	C/T	missense

* The SNP that affected the thoracic vertebral number significantly was shown in bold.

** The position was annotated based on the reference sheep genome Oar_v4.0.