

**Table S7. Distribution of phenotype category of mutant embryos with head defects**

Genotype	Number of embryos	% with head defects	Head phenotype category			
			II	III	IV	V
<b>Pooled samples (data extracted from Table 1 and Figure 6)</b>						
<i>Dkk1<sup>+/+</sup>;Lrp6<sup>Gw/+</sup>; Ctnnb1<sup>+/+</sup></i>	124	6.5	6	2		
<i>Dkk1<sup>+/+</sup>;Lrp6<sup>Gw/+</sup>;Ctnnb1<sup>Bfc/+</sup></i>	43	86	15	15	7	
<i>Dkk1<sup>+/-</sup>; Lrp6<sup>Gw/+</sup>;Ctnnb1<sup>+/+</sup></i>	44	43.2	11	8		
<i>Dkk1<sup>+/-</sup>;Lrp6<sup>Gw/+</sup>;Ctnnb1<sup>Bfc/+</sup></i>	22	100	3	2	12	5
	233*		35 (40.7%)	27 (31.4%)	19 (22.1%)	5 (5.8%)
<b>Specific cross: <i>Ctnnb1<sup>Bfc/+</sup> × Dkk1<sup>+/-</sup>;Lrp6<sup>Gw/Gw</sup></i></b>						
<i>Dkk1<sup>+/+</sup>;Lrp6<sup>Gw/+</sup>; Ctnnb1<sup>+/+</sup></i>	4	0				
<i>Dkk1<sup>+/+</sup>;Lrp6<sup>Gw/+</sup>;Ctnnb1<sup>Bfc/+</sup></i>	6	100	3	3		
<i>Dkk1<sup>+/-</sup>; Lrp6<sup>Gw/+</sup>;Ctnnb1<sup>+/+</sup></i>	8	50	4			
<i>Dkk1<sup>+/-</sup>;Lrp6<sup>Gw/+</sup>;Ctnnb1<sup>Bfc/+</sup></i>	16	100	2	5	5	4
	34*		9 (34.6%)	8(30.7%)	5 (19.2%)	4 (15.3%)

\*No significant difference in the distribution of phenotype categories II-IV between embryos of the pooled sample and the specific cross by Chi-squared test:

$\chi^2=2.527, P>0.05$