**Fig. S1.** Genomic DNA and deduced amino acid sequences of wild type (wt) and TALEN KO *gnrh1* gene. (A) Alignment of genomic DNA sequence of *gnrh1* open reading frame (ORF) region of wt and a *gnrh1* KO line. Underlines indicate left and right TALEN targets. (B) Alignment of deduced amino acid sequence of GnRH1 precursor taken from genomic data of wt and *gnrh1* KO line. Underline indicates a region in which amino acids were mutated. Shaded region indicates GnRH peptide sequence.

**Fig. S2.** Genomic DNA and deduced amino acid sequences of wt and TALEN KO *lhb* gene. (A) Alignment of genomic DNA sequence of *lhb* ORF region of wt and a *lhb* KO line. Underlines indicate left and right TALEN targets. (B) Alignment of deduced amino acid sequence of LHb from genomic data of wt and *lhb* KO line. Underline indicates a region in which amino acids were mutated.

**Fig. S3.** Genomic DNA and its deduced amino acid sequences of wt and TALEN KO *fshb* gene. (A) Alignment of genomic DNA sequence of *fshb* ORF region of wt and a *lhb* KO line. (B) Alignment of deduced amino acid sequence of FSHb from genomic data of wt and *fshb* KO line. Underline indicates a region in which amino acids mutated.
A. ORF sequence of $gnrh1$

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B. deduced peptide sequence of GnRH1

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Fig. S1
Fig. S2

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B. deduced peptide sequence of LHB
Fig. S3

A. ORF sequence of fshb

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fshb KO 2bp deletion ORF
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TALEN left
AGCACGCTGTCATGACATGCCATCTGCTGCTGGGCAAGATGTCAGTTTCTGC
TALEN right
AGCACGCTGTCATGACATGCCATCTGCTGCTGGGCAAGATGTCAGTTTCTGC
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fshb wt ORF
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fshb KO 2bp deletion ORF
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fshb KO 2bp deletion
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