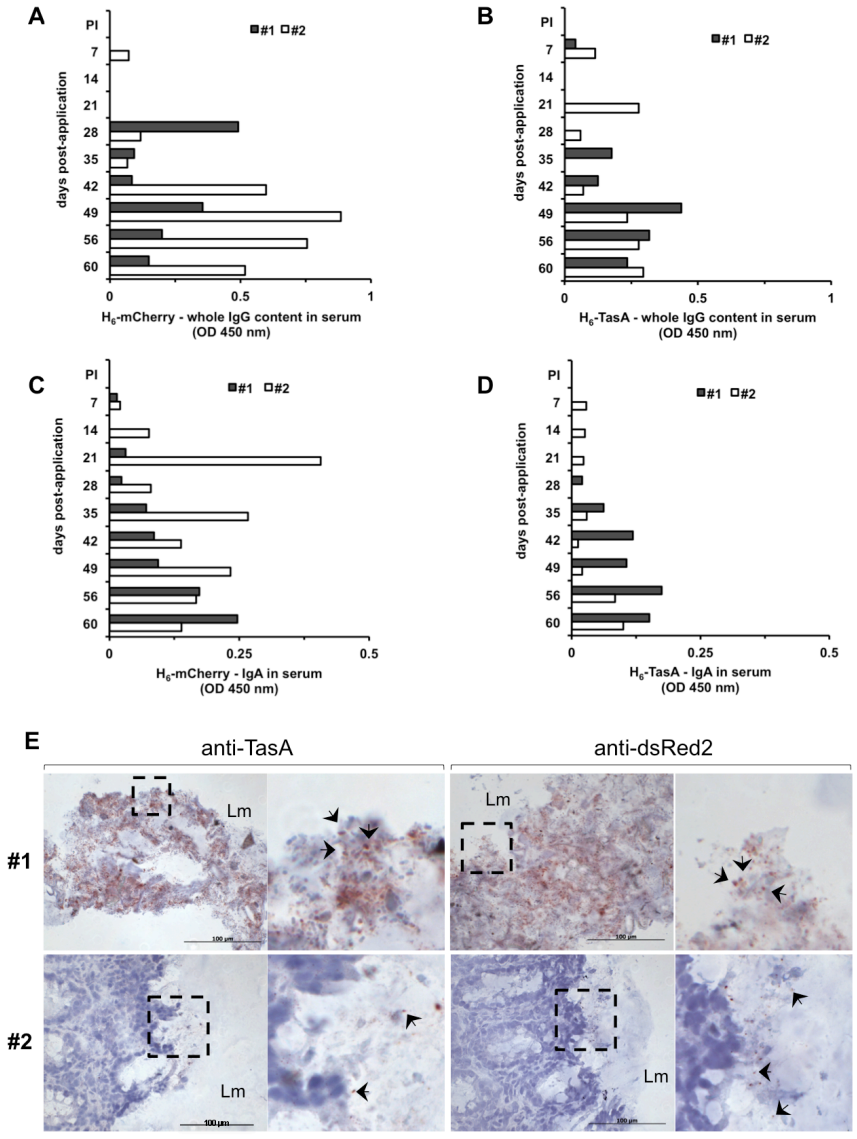

Figure S1. ELISA for the detection of specific immune response against H_6-mCherry (**A and C)** and H_6-TasA **(B and D)** in sera from dogs #1 (gray bars) and #2 (white bars) immunized with spores of *B. subtilis tasA/sinR/lux/*TasA-mCherry strain at increasing times post-application. The whole IgG **(A and B)** and the IgA **(C and D)** specific immune responses for each antigen were determined. **E)** Immunohistochemistry from cecum histological cuts of dogs #1 and #2 for the detection (black arrows) of TasA (anti-TasA, purple, left column) and mCherry (anti-dsRed2, purple, right column) positive bacteria. Intestinal tissue and the bacterial intestinal content were stained with hematoxylin and eosin. Lm: intestinal lumen. Scale bar is 100 µm

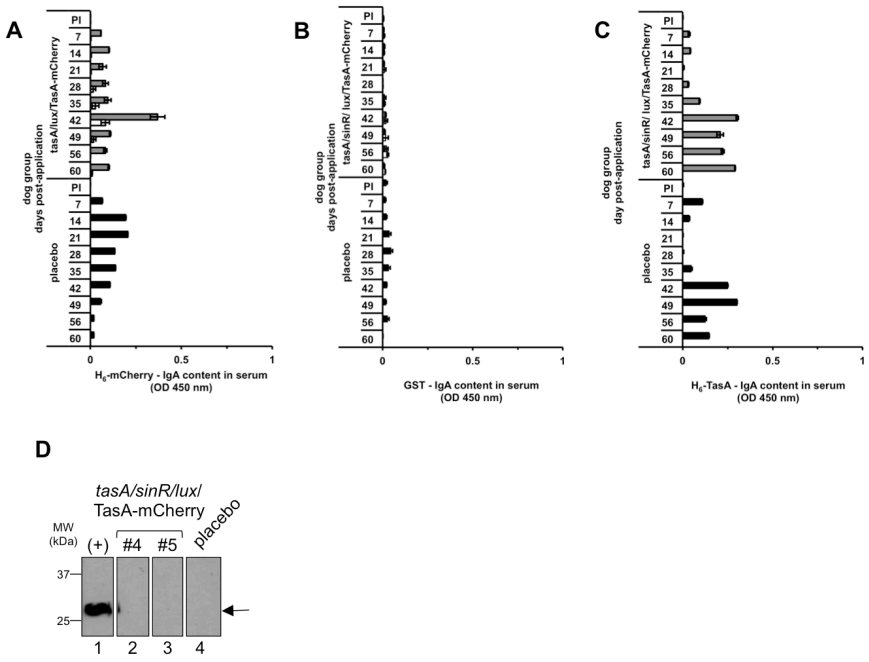

Figure S2. Detection of humoral IgA response. Indirect ELISA of sera from dogs at the indicated days post-application against H_6-TasA (**A**), H_6-mCherry (**B**) and GST (**C**). The sera were diluted to 1:500. Each tested animal group is indicated at Y-axis. Dog #4 (gray bars), dog#5 (white bars) and placebo dog (black bars). The samples were incubated with a secondary anti-IgA dog-HRP. The cut-off was subtracted to all the samples. Each value was subtracted from its corresponding pre-immune value (PI). The data represent the mean±SEM of three independent experiments. **D**) Detection of H_6-mCherry by immunoblotting test strips incubated with the corresponding dog serum (diluted 1:100) at day 60 post-application. The strips were developed using specific anti-dog IgA-HRP. The positive control (+) (lane 1) corresponds to a stripe incubated with a specific mouse anti-dsRed2 (1:1000) followed by anti-mouse-HRP. The arrow indicates the position of mCherry.

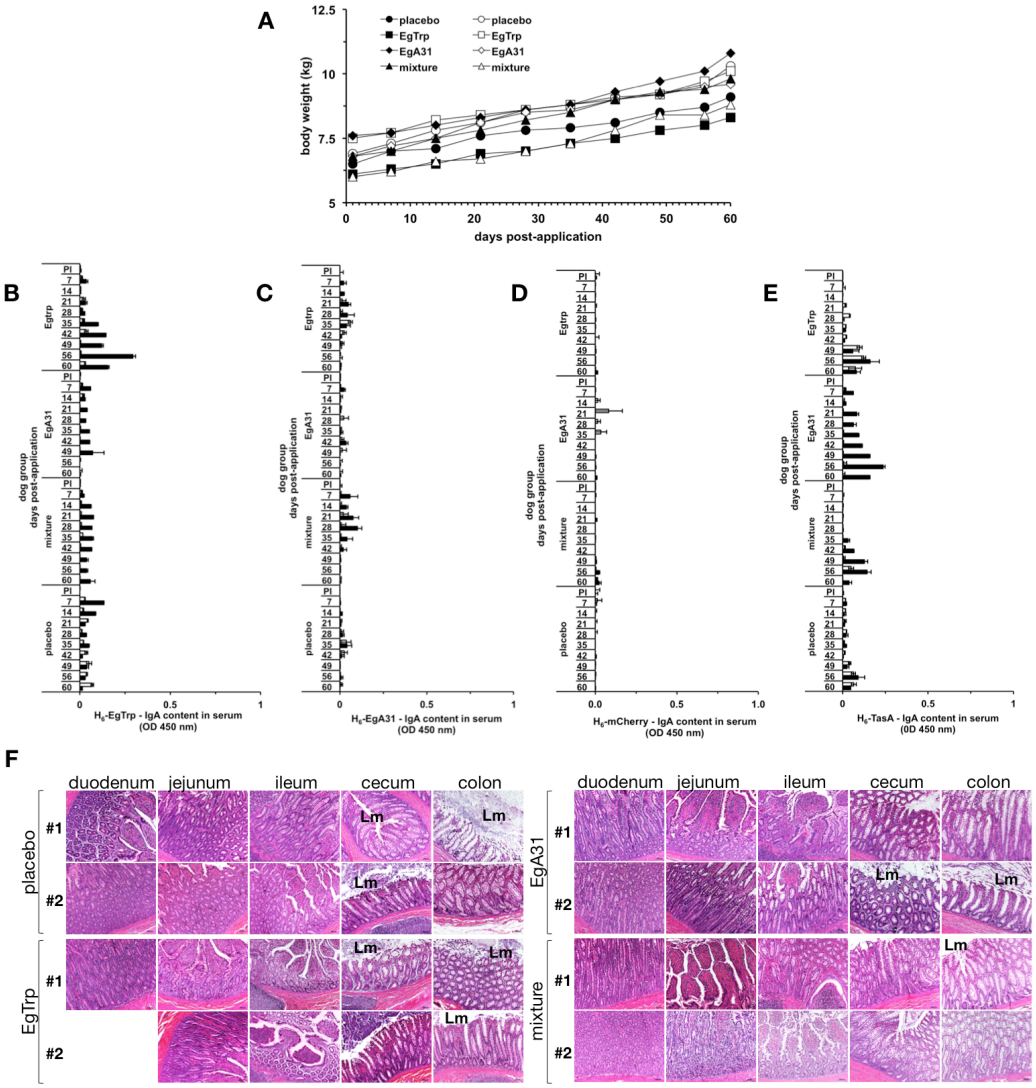

Figure S3. Specific humoral immune response of dogs after oral application of recombinant *Bacillus subtilis* spore carrying *Echinococcus granulosus* antigens. A) Body weight curves of dogs at the indicated times post-application with recombinant *B. subtilis* spores. Indirect ELISA of dogs sera at the indicated days post-application against recombinants H_6-EgTrp **(B)**, H_6-EgA31 **(C)**, H_6-mCherry **(D)** and H_6-TasA **(E)**. The sera were diluted to 1:100. The cut-off was subtracted to all the samples. Each value had subtracted to its corresponding pre-immune value (PI). The data represent the mean ± SEM of three independent experiments. **F)** Histological cuts of a representative of an intestine region of dogs stained with hematoxylin and eosin. The number and the group of the immunized animals are labeled in the left column. Lm, lumen. Scale bar is 100 µm.

TABLE S1. Primers used for plasmid construction.

Amplified segment	Oligonucleotide sequences
pTapA	Fwd.:5′-GATCCCGCGGTCAGAGTTAAATGGTATTGCT-3′
	Rev.:5′-GATCGAATTCGTAAAACACTGTAACTTGATATGACAA-3′
RBS-*luxCDA*	Fwd.:5′-ATGCGAATTCACATAAGGAGGAACTACTATGACTAAAATTTCATTC-3′
	Rev.:5′-GATCGAGCTCACCGGTGCGCCACCTCTGCTATACGCC-3′
luxABE	Fwd.:5′-GATCACCGGTTTATGTGGTGGCTGAATCAGC-3′
	Rev.:5′-GATCGAGCTCTCAACTATTAAATGCTTGGTT-3′
(102-278)EgA31	Fwd.:5′-GATCGGATCCTTGAAACATCTACTAAGCTTGAC-3′
	Rev.:5′-GATCCTGCAGTCAGAAGGAAGTGAGCTCCGC-3′
mCherry	Fwd.:5′-GATCGGATCCGCATGGTGAGCAAGGGCGAGGAG-3′
	Rev.:5′-AGCTAAGCTTTTACTTGTACAGCTCGTCCATGCCGCC-3′

* Restriction enzyme recognition sites are underlined.

**Initiation and stop codons are labeled in bold.

TABLE S2. Assignment of the 16S *rrnE* gene of bacteria isolated from dog's feces.

Isolated sample	Sample origin	Assigned bacterial species
1.8	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
1.20	UZH animal facility	*Enterococcus hirae* strain R
1.45	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
1.50	UZH animal facility	*Enterococcus hirae* strain R
2.1	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM
2.5	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM
2.8	UZH animal facility	*Bacillus aerophilus* strain 28K
2.9	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
2.16	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
3.4	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
5.9	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
5.22	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
6.1	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
6.2	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
6.3	UZH animal facility	*Bacillus vallismortis* DSM11031
6.24	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
7.1	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
7.2	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
7.5	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
7.7	UZH animal facility	*Streptococcus lutetiensis* strainHDP90246
7.11	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
7.24	UZH animal facility	*Bacillus subtilis subsp. subtilis* strain DSM 10
7.25	UZH animal facility	*Streptococcus infantarius* strain HDP90104; SLB
A1	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
B14	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
B16	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
B22	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
B30	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
B32	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
B38	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
B39	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
B41	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
B45	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
B46	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
C11	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
C13	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
C26	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
D2	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
E6	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
E22	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
E24	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
E31	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10

E34	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
E35	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
E36	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
E38	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
E39	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
E46	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
E50	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
F2	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
G29	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10
H2	Outdoor dog	*Bacillus subtilis subsp. subtilis* strain DSM 10