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Speaker Abstracts

The PPGP was cloned from genomic DNA isolated from the Cal Poly chicken population, and the phytase gene was cloned from an *E. coli* isolated from the Cal Poly quail population. The phytase gene sequence is distinct from other *AppA* phytases previously reported, and codes for a functional phytase enzyme. Expression of this new phytase in a yeast system has yielded a functional protein with enzymatic properties highly suited for use in a recombinant poultry system. We have developed a protocol for the isolation and culture of quail primordial germ cells (PGC) from 5.5-day-old embryos for transfection and repopulation of a developing embryo with PGCs harboring the transgene construct. A green fluorescent protein gene controlled by the T7 promoter was included in the construct to allow for the simple assessment of transgene incorporation in cells, developing embryos, and tissues of the adult animals.

Development of methods for the production of transgenic quail expressing an *E. Coli* phytase gene

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Excess phosphorus (P) in manure is a major environmental pollutant associated with poultry and swine production and is directly related to eutrophication, which results in the death of aquatic organisms and loss of biodiversity. Phytate accounts for 50–80% of plant phosphorus and this phytate-bound P is unavailable to simple-stomached animals. As a result, this P is not utilized by the animal and is therefore excreted. Phytases are enzymes that cleave inorganic phosphate from phytic acid, thereby improving its bioavailability to simple-stomached animals. Strategies intended to limit levels of P excretion in production animals have included dietary supplementation of phytase, as well as the use of transgenic crops with reduced phytate levels. Additionally, the recent production of transgenic pigs that express recombinant phytase in the digestive tract has been shown to increase phytate-P availability and therefore reduce P excretion. We have developed a phytase transgene construct for production of transgenic quail as a model system for application to commercial poultry. We have isolated and cloned the chicken preprogastrin promoter (PPGP), which is designed to limit the expression of a recombinant phytase to the proventriculus where it will be secreted into the upper GI tract.