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EDITED BY

**Pavel Trefil** *President of the Czech Branch of WPSA*

and

**Steffen Weigend** *Chair of Working Group 3 "Breeding and Genetics"*

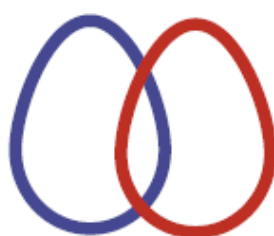


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# Association of VIPR-1 Gene Polymorphism and CRBP-IV Gene Expression with Layer Traits in Rhode Island Red Chicken

Amiya Ranjan Sahu<sup>1</sup>, Sanjeev Kumar<sup>2</sup>, Sonu Kumar Jain<sup>3</sup> and Chethan Raj R.<sup>4</sup>

<sup>1</sup>Scientist, Animal Genetics and Breeding, ICAR-National Research Centre on Pig, Rani, Guwahati, Assam, India; <sup>2</sup>Principal Scientist, ICAR-Central Avian Research Institute, Izatnagar, Uttar Pradesh, India; <sup>3</sup>Veterinary Assistant Surgeon, Jain Gunmala Hospital, Golandas, A.B. Raod, Badarwas, Shivpuri – 473885, M.P., India; <sup>4</sup>Veterinary Assistant Surgeon, Adarshnagar, Arshinkunte Post, Nelamangala Taluk, Bengaluru Rural – 562123, Karnataka, India

Corresponding author: [dramiyavet@gmail.com](mailto:dramiyavet@gmail.com)

The investigation was carried out to determine polymorphism at *VIPR-1* gene and mRNA expression of *CRBP-IV* gene in various tissues in Rhode Island Red (RIR) chicken. Hundred eleven pullets belonging to five hatches were studied. Data on BW20 and layer traits were analyzed by least squares taking sire as random and hatch as fixed effects. Average ASM and EP40 were  $135.19 \pm 1.15$  days and  $124.55 \pm 1.94$  eggs, respectively. Hatch effect was significant ( $P < 0.05$ ) on ASM, EW28 and EP40. BW20 revealed low, but positive genetic and phenotypic correlations with EP40. Allelic profiles of *VIPR-1* at its three loci were performed using *TaqI*, *HhaI* and *TaqI* restriction enzymes. Digestion was monomorphic for *TaqI* and *HhaI* and polymorphic for *TaqI* with allelic frequency 0.98 (A) and 0.02 (B). Genotypic frequencies for AA and AB were 0.96 and 0.04, respectively; but did not show any significant effect on layer traits. Relative mRNA expression of *CRBP-IV* was studied in kidney, liver and oviduct tissues in four different egg production-body weight groups by qRT-PCR and data was analyzed using JMP of SAS. *CRBP-IV* expression revealed significant difference among different egg production-body weights groups only in kidney ( $P \leq 0.05$ ). Expression of *CRBP-IV* was also differed significantly ( $P \leq 0.0001$ ) among tissues and highest expression was observed in oviduct. This investigation generated information related to *VIPR-1* gene polymorphism and analysis with large sample size may yield significant findings. Further analysis of *CRBP-IV* expression at different ages and also in various tissues would help in exploitation of selection for higher reproductive efficiency in poultry.

**Keywords:** Candidate genes, Genotyping, Layer traits, mRNA expression, RIR chicken

## Using high throughput phenotyping of growth and feed intake to improve adaptation of chickens to sustainable diets

Quentin Berger, Elodie Guettier, Séverine Urvoix, Elisabeth Le Bihan-Duval, Sandrine Mignon-Grasteau

BOA, INRA, Université de Tours, 37380 Nouzilly, France

Corresponding author: [quentin.berger@inra.fr](mailto:quentin.berger@inra.fr)

To refine selection of broilers on feed efficiency, we developed an electronic feed station allowing a continuous record of body weight, feed intake and feeding behavior of animals reared on floor. Animals can express their natural feeding behavior as they are raised as a group. Using this station, we compared growth and feed efficiency traits of two genotypes (Label Rouge and standard broilers) fed with two diets (corn-soybean or an alternative diet including more sustainable feedstuffs) which were adapted to the nutritional needs of each genotype.

Diet change had moderate effect on growth and feed efficiency even if the response differed between the two genotypes. Indeed, Label Rouge chickens fed with the alternative diet grew faster (+3.3% at slaughter), ate more (+1.1%) and had a higher FCR (+2.6%) than those fed with the corn-soybean diet. At the opposite, standard chickens fed with the alternative diet grew less (-1.7%), ate less (-4.6%) and had a lower FCR (-2.8%) than those fed with the classic diet.

These first results indicate that animals can adapt to alternative feedstuffs, even those with a rapid growth rate. The variability of response to these alternative diets will now be tested within-genotype in order to check whether some feeding behavior or continuous feed efficiency traits can be used in selection.

**Keywords:** High throughput phenotyping, Feed efficiency, Feeding behavior, Growth, Alternative diet