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Effect of Dietary Dried Berberis Vulgaris Fruit and Enzyme on Some Blood Parameters of Laying Hens Fed Wheat-Soybean Based Diets

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Abstract: A study was conducted to evaluate dried berberry fruit (DBF) and enzyme on some blood parameters of laying hens. In a 5 * 2 completely randomized block design with factorial arrangement and 4 blocks as replicate, 5 levels of DBF (0.0, 0.5, 1.0, 1.5, and 2%) and 2 levels of NSP-degrading enzyme (0.0, and 0.05%) in wheat-soybean based diets were tested in 480, 100-week old laying hens for 4 weeks. Some blood parameters of laying hens including hematocrit value, triglyceride, total cholesterol, HDL and LDL-cholesterol were recorded at 104 weeks of age. DBF significantly (P<0.05) changed hematocrit value and HDL-cholesterol (with or without enzyme), and LDL-cholesterol (with enzyme). It was concluded that use of DBF as a phytochemical compound may improve some of the blood parameters and possibly egg components that are important for human health.

Key words: Berberry fruit, enzyme, HDL-cholesterol, laying hens

Introduction

Berberis vulgaris fruit has been used in the South Asian Traditional medicine as drug (Janbaz and Gilani, 2000). Parts of *Berbeis vulgaris* were also used as a traditional medicine for long in Iran (Fatahi *et al*., 2005). Berberis vulgaris fruit is safe for human consumption that is approved by FDA (Hallagan *et al.,* 1995). Several properties such as antibacterial, antipyretic, antipruritic and antiarrhythmic activities for different parts of *Berberis vulgaris* have been reported (Aynehchi, 1986; Nafissi, 1990, Zargari, 1983). Due to increasing believe on traditional medicines worldwide, evidences suggesting medicinal plants are unlimited reservoirs of drugs. Berberine is a well known alkaloid from *Berberis vulgaris* that is shown to exhibit multiple pharmacological activities such as a potent vasodilatory and antiarrhythmic activity (Fatahi *et al*., 2005), anti-inflammatory and antinociceptive effects of isoquinoline alkaloids found in *Berberis vulgaris* (Kupeli *et al*., 2002), preventive and curative effects of Berberine on chemical-induced hepatotoxicity in rodents (Janbaz and Gilani, 2000), as a food additive to cure cholecytitis (Zargari, 1983; Ishwar *et al*., 2005), and antihistaminic and anticholinergic activities of crude extract of Berberry fruit (Shamsa *et al*., 1999). Recently Fatahi *et al.* (2005) shown that the aqueous extract of Berberry fruit has beneficial effects on both cardiovascular and neural system suggesting a potential use for treatment of hypertension, tachycardia and some neuronal disorders, such as epilepsy and convulsion. No study for the effect of *Berberis vulgaris* fruit and its effect on broiler chickens and/or laying hens is available. There are several studies on the effects of non-starch polysaccharide (NSP) degrading enzymes on laying hens and broilers indicating their positive effects on feed efficiency and performances particularly when the diets contained fats and saturated fatty acids (Bedford *et al*., 1991; Van der Klis *et al*., 1995; Bedford and Partridge, 2001). No study for the effect of *Berberis vulgaris* fruit with or without a NSP degrading enzyme in poultry is available. Therefore the purpose of this study was to evaluate the effect of *Berberis vulgaris* fruit with or without a dietary NSP degrading enzyme on some blood parameters of laying hens.

Materials and Methods

480, 100-week old commercial Hy-line W-36 laying hens were fed wheat-soybean based diets and tested in a 5*2 completely randomized block design with a factorial arrangement (5 levels of dried *Berberis vulgaris* fruit, DBF, 0, 0.5, 1, 1.5, and 2%) and 2 levels of a NSP degrading enzyme , 0, 0.05%, Endofeed W from GNC Bioferm Inc., Canada, with 1200 U/g arabinoxylanase and 400 U/g beta-glucanase activity) with 4 blocks (replicates) for 4 weeks. A blend of animal fat along with the basal diets (Table 1) were used to meet the requirement of laying hens as recommended by Hy-line W36 manual. Some blood parameters including hematocrit value, triglyceride, total cholesterol, LDL-cholesterol and HDL-cholesterol measured at the end of experiment using appropriate laboratory kits (Friedewald *et al*., 1972; Gordon and Amer, 1977). Data were analyzed based on a general linear model procedure of SAS (SAS, 1997) and treatment means when significant, were compared using Duncan multiple range test.