

# Comparative Effects of Phytoestrogen-Containing Preparations of the Kovrak (*Ferula L.*) Plant on the Clinical Indicators of Laying Hens

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**Annotation:** This study investigates the effects of phytoestrogen-containing preparations derived from the *Ferula* (Kovrak) plant—namely “Panarut-98”, “Pano-25”, “Cufestrol”, and dried juice powder of *F. kuhistanica*—on the clinical indicators of laying hens when added to feed at a ratio of 10 g per 1000 kg for 60 days. The results demonstrated improvements in feed intake, vitality, and general condition of the hens, characterized by clean, moist, pink mucous membranes, shiny and smooth plumage, and bright red combs and wattles. Compared with the control group, full egg production was achieved earlier by 22 days with “Pano-25”, 18 days with “Panarut-98”, 15 days with *F. kuhistanica* juice powder, and 10 days with “Cufestrol”.

**Keywords:** Dried juice powder of *Kovrak* plant, LOHMAN SANDY, phytoestrogens, Pano-25, Coumestrol, Panarut-98, laboratory analyses.

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**Relevance of the Study:** The *Ferula L.* genus has been extensively studied taxonomically,

with 106 species identified in Central Asia, primarily growing in mountainous regions. Of these, 96 species are endemic to Central Asia. Many species are concentrated in the Iran-Turon and Afghan-Turon floristic provinces [6]. Ephemeral *Ferula* species are widespread in the Hissar-Darvaz range and southern Tajikistan. Given their biological and morphological diversity, it is essential to differentiate toxic, medicinal, and edible types [7]. The ontogeny of *F. tadshikorum* found in the southern Sarsarok range (700–750 m a.s.l.) revealed its morphological similarity to *F. foetidissima Regel et Schmakh* [8–11]. Modern botanical research confirms that closely related *Ferula* species growing together maintain close genetic relationships [3, 5]. Recently, scientific interest in the *Ferula* family has increased, particularly concerning molecular-level analyses [2]. Studies on ten *Ferula L.* species from the Western Pamir-Alay mountain system have mapped their habitats using GIS and identified the *F. nuratavica Pimenov* population as threatened, recommending its inclusion in the next edition of the Red Book of Uzbekistan [1]. These findings provide a basis for developing conservation strategies for endemic *Ferula* species. In Uzbekistan, extensive reforms in the pharmaceutical and agricultural sectors have prioritized strengthening the raw material base of medicinal plants. Based on *Ferula* species, several pharmaceutical products such as “Panoferol”, “Tefestrol”, “Cufestrol”, and “Ferulen” have been developed and industrially produced [4]. Poultry farming is among the most dynamically developing branches of livestock production in Uzbekistan, providing dietary eggs and poultry meat. Increasing the efficiency of poultry farms and improving productivity are of great scientific and practical importance. The *Ferula L.* genus has been extensively studied taxonomically, with 106 species identified in Central Asia, primarily growing in mountainous regions. Of these, 96 species are endemic to Central Asia. Many species are concentrated in the Iran-Turon and Afghan-Turon floristic provinces [6]. Ephemeral *Ferula* species are widespread in the Hissar-Darvaz range and southern Tajikistan. Given their biological and morphological diversity, it is essential to differentiate toxic, medicinal, and edible types [7]. The ontogeny of *F. tadshikorum* found in the southern Sarsarok range (700–750 m a.s.l.) revealed its morphological similarity to *F. foetidissima Regel et Schmakh* [8–11]. Modern botanical research confirms that closely related *Ferula* species growing together maintain close genetic relationships [3, 5]. Recently, scientific interest in the *Ferula* family has increased, particularly concerning molecular-level analyses [2]. Studies on ten *Ferula L.* species from the Western Pamir-Alay mountain system have mapped their habitats using GIS and identified the *F. nuratavica Pimenov* population as threatened, recommending its inclusion in the next edition of the Red Book of Uzbekistan [1]. These findings provide a basis for developing conservation strategies for endemic *Ferula* species. In Uzbekistan, extensive reforms in the pharmaceutical and agricultural sectors have prioritized strengthening the raw material base of medicinal plants. Based on *Ferula* species, several pharmaceutical products such as “Panoferol”, “Tefestrol”, “Cufestrol”, and “Ferulen” have been developed and industrially produced [4]. Poultry farming is among the most dynamically developing branches of livestock production in Uzbekistan, providing dietary eggs and poultry meat. Increasing the efficiency of poultry farms and improving productivity are of great scientific and practical importance.

**Objective of the Study:** The aim of this research was to comparatively assess the influence of phytoestrogen-containing preparations from the *Ferula* (Kovrak) plant on the general clinical indicators of LOHMAN SANDY hens when included in their feed.

**Materials and Methods:** The experiments were conducted at the “Veterinary Surgery and Obstetrics” Department of Samarkand State University of Veterinary Medicine, Animal Husbandry and Biotechnology. A total of 25 LOHMAN SANDY hens (110 days old) and 15 roosters of the same breed were used. The birds were divided into five groups: Group 1: Received

“Panarut-98” (10 g per 1000 kg feed). Group 2: Received “Pano-25” (10 g per 1000 kg feed). Group 3: Received “Cufestrol” (10 g per 1000 kg feed). Group 4: Received dried juice powder of *F. kuhistanica* (10 g per 1000 kg feed). Group 5 (Control): Fed the basic farm diet without additives. All hens were clinically examined before and during the experiment (on days 0, 5, 20, 40, and 60). Feed amounts were gradually increased in accordance with the hens’ age and nutritional standards: 85 g/day before the experiment, 100 g on day 5, 115 g on day 20, 130 g on day 40, 140 g on day 60. The feeding trial lasted for 60 days.

**Results:** Before the start of the experiment, all hens were in good clinical condition: active, with normal appetite and mobility, clean mucous membranes, bright eyes, and smooth, shiny feathers. By the 5th day, the hens in Group 1 (“Panarut-98”) showed the first signs of egg laying (one hen laid an egg on day 4). In Group 2 (“Pano-25”), egg laying began earlier—one hen on day 2 and two hens on day 4. In Groups 3 (“Cufestrol”) and 4 (*F. kuhistanica*), no egg laying was observed by day 5, nor in the control group. By day 20, feed intake increased to 115 g/day. The number of laying hens rose in all experimental groups, with earlier onset observed in the phytoestrogen-supplemented groups compared with the control. By day 40 (hens aged 150 days), all groups—including the control—had entered the full laying period, with consistent daily egg production. Clinical observations showed high activity, strong legs, bright red combs and wattles, clean mucous membranes, and no signs of inflammation or feather loss. By day 60, all experimental and control groups were fully productive, consuming approximately 140 g of feed per hen per day. Birds remained healthy, active, and responsive, with increased water intake and stable egg production. Before the start of the experiment, all hens were in good clinical condition: active, with normal appetite and mobility, clean mucous membranes, bright eyes, and smooth, shiny feathers. By the 5th day, the hens in Group 1 (“Panarut-98”) showed the first signs of egg laying (one hen laid an egg on day 4). In Group 2 (“Pano-25”), egg laying began earlier—one hen on day 2 and two hens on day 4. In Groups 3 (“Cufestrol”) and 4 (*F. kuhistanica*), no egg laying was observed by day 5, nor in the control group. By day 20, feed intake increased to 115 g/day. The number of laying hens rose in all experimental groups, with earlier onset observed in the phytoestrogen-supplemented groups compared with the control. By day 40 (hens aged 150 days), all groups—including the control—had entered the full laying period, with consistent daily egg production. Clinical observations showed high activity, strong legs, bright red combs and wattles, clean mucous membranes, and no signs of inflammation or feather loss. By day 60, all experimental and control groups were fully productive, consuming approximately 140 g of feed per hen per day. Birds remained healthy, active, and responsive, with increased water intake and stable egg production.

### Conclusions:

1. Supplementation of LOHMAN SANDY hens’ diets with phytoestrogen-containing preparations of the Kovrak (*Ferula*) plant—“Panarut-98”, “Pano-25”, “Cufestrol”, and *F. kuhistanica* juice powder—at a rate of 10 g per 1000 kg feed for 60 days improved appetite, activity, and general physiological condition. Hens exhibited bright red combs and wattles, smooth plumage, and healthy mucous membranes.

2. Comparative analysis of full egg production times showed that hens receiving “Pano-25” reached full egg production 22 days earlier than the control group, those receiving “Panarut-98” by 18 days, *F. kuhistanica* by 15 days, and “Cufestrol” by 10 days.

## References

1. Avalboyev, O. N. (2020). Bioecology of *Ferula* L. species in the Western Pamir-Alai range and improvement of methods for their rational use (PhD dissertation in Biological Sciences). Samarkand. 120 p.
2. Lyskov, D. F. (2015). Systematics of the genus *Prangos* (Umbelliferae, Apioideae) and related taxa: comparison of morphological-anatomical and molecular data (PhD dissertation in Biological Sciences). Moscow. 217 p.
3. Markov, M. V. (2012). Population biology of plants. Moscow: KMK Scientific Publishing Association. 387 p.
4. Najimitdinova, N. N. (2007). Phytochemical study of the roots of *Ferula tatarica* Fisch. ex Spreng. and *Ferula soongorica* Pall. ex Spreng. Author's abstract of dissertation for the degree of Candidate of Pharmaceutical Sciences. Tashkent. 16 p.
5. Oleynikova, E. M. (2010). Classification of structural organization models of herbaceous taproot plants in the Voronezh region. Bulletin of Voronezh State University. Series: Chemistry, Biology, Pharmacy, (1), 99–106.
6. Rakhmankulov, U. (1999). Terpenoid-containing plants of the Western Tien Shan and their use (Doctoral dissertation in Biological Sciences). Tashkent. 243 p.
7. Khalimov, A., & Rakhmonov, Kh. (2014). Tall-grass semi-savanna pastures of the Vakhsh-Pyandzh interfluvium (Tajikistan). Botanical Journal, 99(1), 61–69.
8. Rakhimov, S. (2010). Biological and morphological features of *Ferula* (*Ferula* L.) in Tajikistan. Dushanbe: Donish. 59 p.
9. Rakhimov, S., & Rakhmonov, Kh. (2015). Ontogenesis of the monocarpic shoot of *Ferula tadshikorum* M. Pimen. Proceedings of the Academy of Sciences of the Republic of Tajikistan. Department of Biological and Medical Sciences, 1(189), 7–11.
10. Rakhmonov, Kh. S. (2015). Some biological features and economic significance of Tajik *Ferula* species in Tajikistan. In Proceedings of the Republican Scientific and Theoretical Conference of Faculty Members and Staff of Tajik National University (p. 152). Dushanbe: TNU Publishing House.
11. Rakhmonov, Kh. S., & Rakhimov, S. (2012). *Ferula tadshikorum* M. Pimen. in Southern Tajikistan. Proceedings of the Academy of Sciences of the Republic of Tajikistan. Department of Biological and Medical Sciences, 4(181), 7–11.