



Southern Plains

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Honey Bee Research

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Research

Research Project: [Pests, Parasites, Diseases, and Stress of Honey Bees Used in Honey Production and Pollination](#)

Location: [Honey Bee Research](#)

Title: Protein Diets and Their Effects on Worker Weight, Longevity, Consumption and Hemolymph Protein Levels of *Apis Mellifera*

Author

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Technical Abstract: Physiological parameters of Africanized and European honey bees were explored when fed 4 different protein diets. The treatments were: (1) freshly frozen bee collected pollen, (2) dry powdered old pollen, and two artificial protein diets, (3) Bee Pro and (4) Feed Bee. Bee Pro is a soy meal based diet and has been the industry's standard. Feed bee is a recently developed non-soy based diet. Results are from a laboratory caged experiment that started with 100 newly emerged bees and from a field cage experiment carried out in 5 frame nucs started with a queen and 500 grams of newly emerged bees. The laboratory caged experiment demonstrated that honey bees consumed as much Feed Bee as freshly collected pollen and bees weighed as much as bees fed fresh pollen. The field experiment showed that longevity varied among bees fed different diets

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Publications

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Related National Programs

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Related Projects

- [Sequencing of the Honey Bee Bacterial Pathogen, *Paenibacillus Larvae* and Fungal \(*Ascosphaera Apis*\) Genomes](#)
- [Development of the Database for Honey Bee Genome and Honey Bee Pathogen Genome](#)

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(fresh pollen > Feed Bee > Bee Pro > old pollen). From the laboratory caged experiment the total hemolymph protein levels (via Bradford assays) were similar between bees fed a diet of fresh pollen and Feed Bee (see figure 1). Bees fed Bee Pro and old pollen had lower total hemolymph protein than those fed Feed Bee or fresh pollen. The sugar content of the diets was analyzed for two artificial protein diets. Sugars were extracted by homogenizing the samples in 80°C ethanol and analyzed using HPLC with a refractive index detector. Feed Bee contained 34.9 mg sucrose and 2.03 mg stachyose, where as Bee Pro contained 8.85 mg sucrose and 4.55 mg stachyose. Stachyose is toxic to honey bees; however, the toxic effects are reduced when diluted with 50% sucrose to 4% or less (Baker, J. of Nutrition 107(10):1859-1862). Future research will be conducted to determine which dietary components of artificial protein diets have negative physiological results on honey bees. From these data, different ingredients may be eliminated or substituted.

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