

Sept/Oct. 1998

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Book

Time to Renew

Thank you for your cooperation.

As the beekeeping season begins to wind down, it is time to check your newsletter address label to determine how your subscription is holding out. If the two digit number following your name is "98", then your subscription expires in December of 1998 and it is time to send in a renewal. (If the number is "97" (and there are a bunch of you), then you have either decided that your subscription should end with this issue or that you wish to obtain the newsletter for free (except for the line charges) from the World Wide Web. In case you haven't tried the web for my newsletter or other contributions, try <http://entomology.ucdavis.edu/faculty/mussen/>. From there you have two options: "news" or "briefs".

For those of you wishing to continue receiving "hard copies" of the newsletter in the mail, send your check (made payable to the **(Regents of U.C.)**) to me at my office address.

Pollen Transfer Devices

In situations where honey bees do not seem to be moving enough compatible pollen between flowers, various approaches have been tried to introduce more pollen. Bouquets hung in buckets only helped on that portion of one tree. Pollen blasted or applied aerially to trees helped some, but only if adequate bees were around to move the pollen gains to the stigmas.

The most commonly used device is a pollen insert (or pollen dispenser). Pollen is collected from the desired flowers, may or may not be combined with a diluent, then placed in an apparatus that dusts outgoing bees with pollen.

Studies by Fani Hatjina at the Technological Educational Institute of Thessaloniki, in Greece, suggested that there may be a better way to get pollen distributed, if it is reasonably abundant. Instead of creating dust piles through the bees must crawl, Fani attached strips of various plush pile materials along the

bottom board and bottom of the brood box, leaving about a bee space for the bees to move through.

The theory is that incoming bees rub against the material and leave some pollen behind. The outgoing bees contact that pollen on the way out. Thus, the transfer device works all day and does not need refilling. Much of the pollen picked on departing bees will be "fresh" pollen.

The complete text of "Hive-entrance fittings as a simple and cost-effective way to increase cross-pollination by honey bees" can be read in Bee World 79(2):71-80 (1998). Bee World is an Inter-national Bee Research Association publication.

Pollination Information

Have you ever wondered or been asked about the necessity for pollination for a particular crop? The information was not too easy to find. Some of us were lucky enough to have a copy of S.E. McGregor's (1976) Insect Pollination of Cultivated Crop Plants, USDA/ARS Agriculture Handbook No. 496.

A combined effort of the A.I Root Company and the Tucson bee lab has made the text of that publication available on the World Wide Web at <http://www.airoot.com/beeeculture/book/index.html>. Even more impressive is the fact that the text will be updated, continuously, as more information becomes available on any crop.

Now growers and beekeepers can get crop pollination information from electronic experts.

Three Types of Varroa

Researchers at the USDA/ARS bee lab in Baton Rouge joined forces with Australian researchers to try to determine if differences noted in pathogenicity of Varroa mites in South America, versus those in the U.S., might be related to geographic origin of the mites. Varroa originated in Asia, but like honey bees, there could be various "races" or "subspecies."

Analysis of Varroa from various countries revealed that at least three genotypes exist. For the purposes of the report, they are called the Russian, Japanese, and Papua New Guinea types. In Brazil, where Varroa seem to cause little or no problems in the colonies, the mites are the Japanese type. In the U.S. and Europe, where Varroa causes significant damage or death to colonies, the Russian type is found. Currently, the Papua type has been found only in New Guinea.

This information has a bearing on Varroa mite resistance breeding programs. Obviously, the mites involved in the programs should be the same mites that are causing the problems. Also, bees that seem to tolerate one type of mite may not be able to tolerate a type that happens to be more pathogenic to them.

A brief report on the study can be found in the Journal of Apicultural Research 37(1):49-51,

1998. The article is "Congruence of RAPD and mitochondria DNA markers in assessing Varroa jacobsoni genotypes," by L. Guzman, T. Rinderer, J. Stelzer and D. Anderson.

Second Hive Ventilator

Following on the heels of the Bee Cool® bee hive ventilator, sold by Bee Cook, P.O. Box 727, Williston, VT 05495 [(802)425-3633] or www.beecool.com, the Bee Supply Company of Hawaii has introduced the Solar Bee Breeze® to the market. Unlike its predecessor, which replaced the whole hive cover, the Solar Bee Breeze is a self-contained circular unit 8.5 in. in diameter that fits in a 5 in. circular hole cut in the hive cover.

The fan of the new ventilator runs on solar energy. Warm, moist air from inside the hive is drawn up and out the top. Screens prevent access to bees from either inside or outside of the hive.

The housing is either acrylic (\$35 each, including shipping) or stainless steel (\$52 each, including shipping). Supplies are limited and the prices quoted are said to be introductory. For more information contact the Bee Supply Company of Hawaii, P.O. Box 1025, Kailua, HI 96734.

4-H Essay

The American Beekeeping Federation is, again, sponsoring a national 4-H Essay Contest. The contest is open to all "currently active" (fees paid) 4-H members, and provides cash prizes of \$250, \$100 and \$50, for first, second

and third places, respectively. National winners are chosen from a group of state winners (only one per state), and each state winner receives "an appropriate book about honey bees, beekeeping, or honey."

The assigned topic for the **1999 Essay** is to "create a **Lesson Plan** and **Activity Sheet** to teach **3rd Grade** elementary school students about honey bees and beekeeping."

"The Lesson Plan should cover the roles of the three castes of honey bees in the colony and one other aspect of bees and beekeeping, such as but not limited to, pollination, honey production, uses of honey, or apitherapy. The Activity Sheet could be in the form of a crossword puzzle, a word-search puzzle, a drawing on which students label a bee's body parts, a connect the dots puzzle, etc. The Activity Sheet must be the entrant's original work, and it must be suitable for photocopying, since the ABF hopes to be able to share these with teachers on request."

The "scope" of the research accounts for 40% of the score. Good leads can come from libraries, beekeepers, extension agents, professors, and others. Surfing the web will lead to all sorts of information on honey bees: www.abfnet.org is a good place to find links to other bee sites. Be sure to document **all** of the sources in a list of Resources or Bibliography at the end.

The format of the essay must be as follows:

1. Typewritten, double spaced, on one side of the paper following standard manuscript format
2. 750 to 1000 word Lesson Plan, plus the Activity Sheet
3. Written only on the designated subject
4. All factual statements must be referenced with biographical-style endnotes.
5. A brief biographical sketch of the essayist, including date of birth, gender, complete mailing address, and telephone number, must accompany the essay. (References and biography not counted in the 750-1000 word limit.)

Essays should be completed and mailed to reach the office of Dr. Eric Mussen, Entomology, University of California, One Shields Avenue, Davis, CA 95616-8584 by February 15, 1999. Winners will be announced in May.

Nutraceuticals

A new word is entering our vocabulary. Nutraceuticals are foods or food supplements that provide chemicals thought to be advantageous to our physiology. The idea is to consume enough of these substances to help ward off diseases and disorders before they set in. Many people see huge potential in this market and almonds and honey are going to be promoted on the nutraceutical lists.

The following article from the summer 1998 Honey Hotline, published by the National Honey Board, provides an example of how honey may be involved in improving our health.

The ability of standard yogurt cultures, S. thermophilus and L. bulgaricus and probiotic cultures L. acidophilus and bifidobacteria, to ferment honey was investigated.

Results showed there were no significant differences between honey, glucose and sucrose in their ability to support lactic acid bacteria growth. However, growth of bifidobacteria, which is typically slow in milk, was enhanced in the presence of honey. The following study investigated this further.

Study Indicates Honey Promotes Bifidobacteria Growth.

In a concurrent project funded by the National Honey Board, researchers at Michigan State University also investigated the effect of honey on growth, activity and viability of commercial bifidobacteria in fermented milk. Dairy products have been the preferred medium to reintroduce viable populations of lactic acid bacteria and bifidobacteria into the gastrointestinal tract of both children and adults. However, maintaining viability of bifidobacteria during processing and refrigerated storage is often a challenge to dairy processors. Manufacturers often use pro- and pre-biotics to facilitate growth and viability of desirable bacteria.

Method

To test honey's potential as probiotic, tempered grade A clover honey, sucrose, fructose and glucose were each added at one, three and five percent levels to twelve percent reconstituted nonfat dry milk (NFDM). A NFDM control with no sweetener added was used. Each of the 13 samples was divided in half and inoculated with Bifidobacterium Bf-1 or Bifido-bacterium Bf-6. Both are commercial strains of bifidobacteria. Each sample was then tested to determine the viability, activity and growth of bifidobacteria over four weeks of refrigerated storage.

Conclusions

Results indicate that honey enhanced the growth, viability and activity of bifidobacteria in milk over the other tested sweeteners and the control. Additional research is needed to investigate and confirm the growth-promoting activity of honey on bifido-bacteria.

Another example of "good stuff" in honey was published by S. Frankel, G.E. Robinson and M.R. Berenbaum in the Journal of Apicultural Research 37(1):27-31 (1998). The authors extracted antioxidants from samples of 14 different varietal honeys from various U.S. states. All honeys had some, but the lighter milder honeys, like CA sage, CA eucalyptus, CA yellow starthistle, and CA orange had about one-third as much as darker honeys like FL tupelo and eastern buckwheat. How do these honey values compare to other foods? About equal with sweetcorn and tomatoes, and less than broccoli or sweet peppers. If you really want a jolt of antioxidants,

drink a cup of black tea - it is orders of magnitude greater than honey.

Better French Fries

Honey Coated French Fries - Researchers at the University of Georgia-Athens have determined a way to improve the quality of french fries using batter containing honey. During their study, researchers determined that the addition of 1.5 percent honey to fresh-processed french fries produces a golden fried product that is more moist and contains less fat than commercially frozen samples. The honey-coated french fry and the two percent honey-coated commercial frozen french fries were ranked highly acceptable by trained panelists.

French fries are a popular food in the United States. Although consumers today are becoming more interested in nutrition, they are not willing to sacrifice quality and taste. To appeal to the more health-conscious consumer, manufacturers of french fries can benefit from finding ways to produce french fries that contain less fat while maintaining quality during frozen storage.

Objectives

Based on previous research, honey has the potential to decrease fat absorption, improve flavor and prevent quality changes in fries during frozen storage. The goal of this research was to develop french fry products coated with honey while studying the effects of honey on these products. Research also set out to:

Commercially frozen and fresh-processed french fries were (Cont.)

1. Identify the optimal level of honey in a french fry coating.
2. Investigate the moisture content, fat content, texture, color and flavor of honey-coated fresh processed french fries.
3. Investigate the moisture content, fat content, texture, color and flavor of honey-coated, commercially frozen french fries.

Methods

Two types of french fries were coated with the same solution. One type, fresh-processed, was made with fresh potatoes purchased from a grocery store. The other type was a commercially frozen potato strip also purchased from a grocery store. Both the fresh-processed and commercially frozen potato strips were treated with coating solutions containing honey at levels of 0, 0.5, 1, 1.5, 2, 4, 6 and 8 percent, respectively. The solutions consisted of 14 percent methyl cellulose, four percent hydroxypropyl methyl cellulose (HPMC), 80 percent ethanol and honey at the varying levels noted. Potato strips were immersed in the solutions for 15 seconds followed by forced air blowing for 15 minutes at 25° C. Samples without a coating treatment were used as controls. All potato strips were deep fried in hot oil at 180° C for three minutes prior to testing.

Analysis

(Cont.) analyzed for texture and color and underwent sensory analysis.

Texture

Honey-coated french fries had significantly lower total force energy (627-729 kg/min) and shear values (10.7-12.9 kg/g) than control samples (763 kg/min and 14.02 kg/g).

Color

Increasing the honey level produced fries which were less yellow, darker and more red.

Sensory analysis

No significant differences among samples for crispness, color, moisture or overall acceptance were found. Samples coated with two percent honey were ranked as the most acceptable products among treatments.

Conclusions

- There was no significant difference in crispness among samples. Honey coating provided a softer interior texture in both commercially frozen and fresh-processed samples.
- Color was significantly affected in commercial and pilot-plant samples. Increasing the level of honey caused samples to appear less yellow, more red and darker in color. However, yellowness was not significantly affected in fresh-processed samples.
- While trained panelists could detect a "special flavor" in french fry samples treated with higher levels of honey, none of them could identify the honey flavor. Two percent honey-coated commercial fries and 1.5 percent honey-coated fresh

processed fries were ranked as the most acceptable products.

This information was published in the National Honey Board's Honey Hotline for Winter 1997/98. For more information on this topic or other Honey Board sponsored research call the Honey Hotline at (800)356-5941.

Free Management Book

Periodically I have listed various UC publications on personnel management that were available for sale. One very good reference: "Labor Management in Ag: Cultivating Personnel Productivity," written and recently revised by Gregory Billikopf, contains topics like conflict management, employee selection, performance appraisals, incentive pay, interpersonal solutions, employee discipline, and more.

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Now you can download your own copy of this book onto your hard drive or floppy disk from the web.

English edition -
<http://www.cnr.berkeley.edu/ucce50/7book.htm>

Spanish edition -
<http://www.cnr.berkeley.edu/ucce50/7grego.htm>.

Sincerely,

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