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Antibiotics in Honey

The recent discovery of traces (0.3 to 34.0 ppb) of the antibiotic chloramphenicol in honey has rocked the honey industry. Many countries are sampling and analyzing bulk honey shipments for illegal antibiotic residues.

How could an antibiotic get into honey (or crayfish)? Probably by the use of the antibiotic in hives to prevent or cure honey bee diseases. This is not a new procedure. Anti-biotics frequently are used in animal health programs to prevent disease and promote faster growth. Our use of oxytetracycline in swine, poultry, and honey bees are examples.

The problem comes from the use of unregistered antibiotics in the food chain. In the case of chloramphen-

icol, that antibiotic is reserved in US medicine for combatting stubborn, resistant bacterial infections of humans. Chloramphenicol is a potent antibiotic. In a very few people it can cause a lethal blood disease, even when administered in miniscule amounts. Thus, the big concern over chloramphenicol.

From the point of view of honey, there are no "tolerances" for antibiotics. A tolerance is the maximum amount of a substance residue that is permitted to be in a product after the substance has been used as a "pesticide" application.

In the cases of oxytetracycline and fumagillin, when used as labeled, there are no detectable residues in honey. However, that may not always be the case.

The ability of analytical laboratories to find residues has continued to be refined over the years. When the labs could accurately measure only ppm's (parts per million), then a "trace" meant a very few parts per million or a fraction thereof. Now, labs can quantify most chemicals to ppb (parts per billion), that are one thousand times smaller than ppm. "Trace" currently means a very few parts per billion or even parts per trillion (a thousand times smaller, yet).

An excellent article on this topic was written in the Summer 2002 (Issue #108) edition of Beelines, published by Saskatchewan Provincial Apiculturist, John Gruszka. In the article, a table shows the changes in detection limits for some antibiotics from 1999 to 2001:

Tetracycline	0.1 ppm to 0.007 ppm
Oxytetracycline	0.1 ppm to 0.006 ppm (that's 6 parts per billion!)
Chlortetracycline	0.1 ppm to 0.010 ppm
Sulfa drugs	0.1 ppm to 0.015 ppm.

It is obvious that it is going to be very easy to determine what chemicals have been placed into hives, even more than a year earlier. The more persistent the chemical, the more readily it will be found. Keep this in

mind if you decide to use an "alternative treatment" for AFB control.

Currently, oxytetracycline (in a powdered sugar "dust") and fumagillin in syrup are "used up" when applied as instructed. Apparently, due to the fragility of oxytetracycline (Terramycin[®]), even use in extender patties has not led to problems.

If the registration of future antibiotics for control of American and European fowlbroods goes as I have heard, then we probably will have residue tolerances set and we will have to use tylosin and lincomycin differently than we used oxytetracycline in the past.

The new antibiotics will be labeled for "therapeutic" use, only, but not for "prophylactic" use. That means you have to see disease signs (one or more sick larvae) before you use them. They will not be registered for preventive treatments.

This is the fall-out of concerns about chronic, preventive use of antibiotics leading to selection of resistant strains of bacteria. In the case of swine and poultry, etc., there is evidence that antibiotic resistance in domestic animals has transferred to microbes in humans. I doubt

that this would be a problem with honey bees, but regulations are written for general applications, and exceptions for specific cases are very difficult to acquire.

Thus, as a beekeeper, you will have to wait until there are sick larvae containing millions of infectious spores per bee in the hive before you can make an antibiotic application. It only takes a couple weeks to develop a roaring case of AFB that can infect the rest of your colonies and the colonies of anyone else within flight distance. So, you are going to have to be checking those colonies real frequently to avoid disaster.

Brief Research Reviews

Gas chromatographic determination of coumaphos and tau-fluvalinate residues in royal jelly produced under commercial conditions by Panos Balayannis. J. Apicul. Res. 40(2): 71-78 (2001).

This Greek study monitored the acaricide levels in royal jelly following treatments with coumaphos spray and fluvalinate on plywood inserts. No fluvalinate was found. It took 42 days for coumaphos levels to drop to "trace" amounts.

Fatty acids in pollen: a review of their importance for honey bees by Rob Manning. Bee World 82(2): 60-75 (2001).

Probably one of the most exhaustive studies done on the fatty acids of Australian pollens. Tables show that fatty acid composition of bees changes as they develop. Fascinating ideas include the "seeping" of fatty acids into the beeswax "sterilizing" the cells. Thus, during times of pollen dearths, the "stress" to bees may be due to higher loads of pathogenic microbes.

Respiratory symptoms and pulmonary function tests in beekeepers exposed to biomass smoke inhalation by Mehmet Polatli et al. J. Apicul. Res. 40(1-2): 51-57.

Exposure to smoke from biomass combustion is reported to be a main cause of chronic bronchitis and chronic obstructive pulmonary disease (COPD). If this is true, do beekeepers suffer more than non-beekeepers? Tests were run on pulmonary performance of 34 beekeepers and 25 matched non-beekeepers. There was no difference due to short term exposures to smoker fuel smoke. However, in either group, smoking tobacco products lead to decreased lung function and increased respiratory symptoms.

CSBA 2002 Annual Conference

The 2002 California State Beekeepers' Annual Convention is scheduled for the second full week of November at the Doubletree Hotel, 1150 9th Street, Modesto, CA 95394 [(209)526-6000].

Monday, November 11

Afternoon Board of Directors' Meeting

Tuesday, November 12

8:00 am Registration and Exhibits
9:00 Opening Ceremonies and Committee Reports
10:00 Exhibitors' Break
10:30 "Impact of Fungicides on Bees and Almonds - **Frank Eischen**
11:15 "Future of the National Honey Board - **Gene Brandi**
11:30 Future of California Almonds - **Almond Board Rep**
12:00 pm Lunch Break
1:30 "ABF Honey Queen" - **Colleen Henson**
1:45 "ABF and 2002 Farm Bill" - **Pat Heitkam**
2:00 "Early Queen Supersedure: Why and How to stop it" - **Medhat Nasr**
2:40 Exhibitors' Break
3:10 "Apitherapy" - **Reyah Carlson/George Castillos**
3:55 "Africanized Honey Bees" - **Eric Mussen/Robin Mountain**
4:05 "Bee Nutrition Panel" - **Eric Mussen, Moderator**
6:00 Honey Queen Reception - Presidential Suite

Wednesday, November 13

8:30 am Board Busses for all-day **Beekeeping Field Day**
4:45 pm Sioux Honey Cooperative meeting
6:00 Wine Tasting at "The Fat Cat"

Thursday, November 14

8:00 am Registration and Exhibits
"American Honey Producers" - **Lyle Johnston**
8:15 "Foraging Younger and Working Harder" - **Tanya Pankiw**
9:00 "Medicinal Uses of Honey" - **Marcia Cardetti**
9:45 Exhibitors' Break
10:00 "Ladies' Aux. Brunch and Meeting - Maxi's Restaurant
10:15 "Honey Market Report" - **Bob Brandi**
10:30 "Future of Alfalfa Seed" - **Gary Lindley**
11:00 "Early Queen Loss in Packages" - **Gloria Hoffman**
11:45 "CSBA Pollination Survey" - **Matt Beekman**
12:00 pm Lunch Break
1:30 "CSBA Annual Business Meeting"
3:30 "Annual Auction"
6:15 "Silent Auction/Social Mixer
7:00 "Awards Banquet"

Friday, November 15

Breakfast Board of Director's Meeting

Joe Traynor's Study

Those of you who have not met Joe Traynor, a "bee broker" from Bakersfield, have missed a treat. Joe is never at a loss for "creative ideas." Last summer, Joe was researching honey for the book that he just published (see May/June issue of this newsletter).

Joe read that in order for the enzyme in honey to produce hydrogen peroxide, the pH had to be between 5.5 and 8.0. The sodium level had to be about 2300 ppm. His clover honey pH was at 4.2 and his orange at 4.1. Both had a sodium level of about 30 ppm. So, he added "1 part sodium bicarbonate to 100 parts honey."

After two hours, the clover honey had a pH of 6.9, the orange honey 6.8. After a week, the pHs were 7.6 and 8.0, respectively.

Joe didn't measure the production of hydrogen peroxide or reduction in glucose, but he did say that some "tasters" preferred the treated honey over the original. Joe decided that his treated honey probably is "adulterated," but that makes him wonder whether or not honey mixed with baking soda in a recipe results in a baked product that contains "pure honey."

Apicure® is Here

Apparently, Apicure, Inc. has obtained a Special Local Needs (SLN) registration for Apicure (formic acid) in California. If we can get our hands on it, here are some use comments.

1. It is registered to control both mites (tracheal and *Varroa*).
2. There can be no honey supers on the hive while it is being used.
3. It is left in the hive about the same length of time as the plastic strip applications.
4. Can be used in the spring and fall.
5. Works best when there is no sealed brood.
6. Can be used while other treatments are going on in the fall.
7. There is likely to be some brood reduction with spring treatments.

Bee Sim Something

I have to be careful about using trademarked names. However, there are two simulation programs available to you over the Web that will help give you an idea of what effects changes can have in your colony population or your economic bottom line.

VarroaPop v 2.1 is now available for download at <http://gears.tucson.ars.gov/soft/index.html>. It simulates the growth of *Varroa* mite populations in colonies. The program demonstrates how *Varroa* mites influence colony population growth throughout the year. An operator can change many factors through the menus in the model such as the initial population size, queen egg laying potential, and mite reproduction rates, to see how these factors influence both colony and mite population growth.

The second downloadable program is BK-Economics 1.34 for Windows and Macintosh. It was developed to assist commercial beekeepers in streamlining their business practices. This software allows beekeepers to simulate years of business, taking into account factors like equipment purchases, labor force, transportation, marketing strategies, loans, honey flow, and other hive products without taking the

usual risks. This software, when used in combination with the marketing strategy information in publication, can help beekeepers formulate a successful business plan when making financial decisions, expanding an operation or just starting out.

"New" Organic Time

This information is "borrowed," nearly intact from an article by Imperial County CE Farm Advisor Keith Mayberry in the October issue of Imperial Agricultural Briefs.

Organic Farming Registration and Certification

There are growing number of consumers who prefer to buy organically grown produce. Some think the produce is safer while others cite perceived views that organic is healthier for the land in the long run. The demand for organic produce is attracting more producers.

There are a number of steps required to become **registered** and **certified** for organic production. Those regulations are designed to maintain the integrity of the products being marketed. There are a number of private organizations that also certify production according to standards within their organizations.

Individuals in California who sell products as organic must be registered with the California Department of Food and Agriculture (CDFA) which will, at the end of October 2002, be in compliance with the National Organics Program (NOP). The local county agricultural commissioner serves as the **registering agency**. For the latest compliance information and a list of materials approved for use in organic production, visit the commissioner's office or try the CDFA Web site:
www.cdfa.ca.gov/is/fveqc/organic.htm.

In addition, organic farming will fall under the NOP as outlined at the following Web site:
www.ams.usda.gov/nop/. Since California has an existing set of laws concerning organics, it will fall into the category described by NOP as follows: "A State may choose to establish a State Organics Program (SOP). Under this option, all organic producers and handlers in the State would have to be certified according to the SOP, which would include requirements of the NOP and the more restrictive provisions unique to that State and approved by the USDA. The State would assume enforcement responsibility, within its borders, for the requirements in the national standards and its SOP. However, the State may

not initiate proceedings to suspend or revoke the accreditation of any certifying agent accredited by the USDA. Suspension or revocation of an accredited certifying agent may only be pursued by the USDA."

"Any operation that sells or labels a product as "organic," except in accordance with the Act (OFPA) and the national standards, may be subject to a civil penalty of not more than \$10,000 per violation and the provisions of 18 U.S.C. 1001."

Certification is somewhat different in that the growing, processing, handling and retailing enterprises are regulated by private, independent certifying agencies that are regulated by CDFA and under the new law, by NOP. This process allows the seller to market the products as "certified organic." The process is very comprehensive and requires careful book-keeping and adherence to standards of compliance as outlined in the regulations of the certifying agency.

Pest Management Guidelines

For years the University of California has made available recommendations for controlling major crop pests in California. These recommendations do not include ALL the materials registered to

control the pest, but just the ones that we think are better. You used to have to go to a County "Farm Advisor's" office to get copies.

Now, you can read and download (at least print) copies for yourself by going to the following address:
<http://anrcatalog.ucdavis.edu/merchant.ihtml?id=360&step=2>
. Or, if you prefer, stop typing the previous address at *edu*. Then, under the category Pest and Disease Management, you will find a link to Pest Management Guidelines.

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The county office can still print individual guidelines for you at \$5.00 apiece. The complete set, that used to sell for \$125, is no longer available.

Sincerely,

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