The following information was gleaned from Cass Cohenour's blog at http://wvbeekeeper.blogspot.com/.

HONEY

Alhough you may think it because they make it, honey is not the best feed for bees. Honey is in essence bee food that has been processed so that it won't spoil. Bees prefer to eat nectar when given the chance. Be sure to know the source when honey is used as a feed or as an ingredient in one of the following recipes. If at all possible only re-feed honey to the same hive it was harvested from. Never use store-bought honey. Store-bought honey may contain AFB or other such spores that can be deadly to bees.

High Fructose Corn Syrup (HFCS)

It is not uncommon for a beekeeper with many hives and little time to use high fructose corn syrup in place of 2:1 syrup, however this method is not cost effective or practical for small-scale beekeepers. Pollinators are more prone to feed with corn syrup because most of the crops that they pollinate don't produce enough nectar for all the colonies in the field. Be sure to check the list of ingredients when purchasing high fructose corn syrup not specifically packaged as bee feed. Many suppliers often add extra ingredients that may not be desired when feeding bees. Your best bet is to buy from a supplier of beekeeping equipment such as Mann Lake or Brushy Mountain.

Bee Candy

Occasionally it is not advised to feed bees syrup. Sometimes when emergency feeding it is best to use a dry or semi-moist food. Some times bee candy is used because it is not as messy as feeding syrup. Even though bee candy may be convenient to use as feed, it is not recommended as a complete substitution to syrup.

Un-prepared Sugar

The simplest bee candy is crystallized cane sugar. Pure sugar is generally only fed during dire emergencies. Bees will sometimes carry it out of the hive rather than consume it. In the winter when syrup is not a preferable supplementary food source,s ome people place it over the top bars in a hive on newspaper. If the colony runs out of stores it can eat its way up to the sugar

Fondant Bee Candy

Fondant bee candy can be fed directly to the bees once cooled. Fondant is a

good food source for mini-mating nucs because there is no drowning involved when you have a small amount of bees. It is also common to use this recipe in small quantities to plug the hole on a Queen Cage.

> 4 parts (by volume) white sugar
> 4 parts (by volume) 2:1 Syrup or HFCS
> 3 parts (by volume) water

Boil water and slowly add the syrup and sugar until dissolved. Continue heating until the mixture reaches 238°F (114°C). Without mixing allow the solution to cool until it is slightly warm to the touch. Then begin to mix and aerate the solution. As you do this the color should lighten. Pour into shallow dishes or mold and save for later use.You can make the fondant thin enough to where it can be worked into an empty frame of drawn comb.

Quick Candy

If you are pressed for time quick candy can be used in place of Fondant Bee Candy. It is easier to prepare but may not be as easily workable.

> 1 part (by volume) confectioner's sugar
> 1 part (by volume) 1:2 Syrup or HFCS or Clean Honey

Just knead the two ingredients together like bread dough until it is mixed thoroughly.

Pollen Substitute

Sometimes there is a shortage of pollen or a beekeeper may want to stimulate the queen into rearing brood before the spring flow. Pollen substitutes can be used in such situations. Despite its name pollen substitutes are no real substitute for genuine fresh pollen.

Dry Pollen Substitute

Dry pollen substitute can be placed directly into the hive or used in bird feeders to attract local bees. If you wish to not order or purchase a prepackaged pollen substitute from a beekeeping equipment supplier you can make your own with these ingredients which should be available locally.

> 3 parts (by weight) Soy Flour (expeller-processed soybean flour)
> 1 part (by weight) Brewers Yeast
> 1 part (by weight) Nonfat Dry Milk (Not instant milk)

Simply mix the powders together and use. Occasionally bees may refuse to eat pollen substitute, most often when fresh pollen is available. It is however

possible to trick bees to take the substitute when necessary by adding a small amount of Vitamin C into the mixture. Often 1 teaspoon per 5 cups can be added. If a powered form is not available, it is possible to crush a Vitamin C tablet to add to the mixture.

Pollen Patty

To make a pollen patty mix the Dry Pollen Substitute with enough 2:1 Syrup or HFCS to make a putty or dough like consistency. Some beekeepers will add other ingredients to increase the amount of certain vitamins or amino acids or will add the extra ingredients to make the patty more palatable for the bees.

Grease Patties

Grease Patties that contain both wintergreen oil or tea tree oil and mineral salt appear to have an effect on varroa mites and tracheal mites. These effects can be seen when brood is present and has a devastating effect on mites when brood is not present. Remember that grease patties with essential oils should not be used during time of honey collection for human consumption. When the bees are making a surplus of honey grease patties without essential oils can be used to a lesser effect. For any noticeable effect a grease patty of some form should be used at all times. Replace any consumed patties. Grease patties are awesome to use in the winter time and if mixed to the right consistency can easily be pressed into an empty frame of drawn comb or placed on the top bars above the cluster on a piece of waxed paper.

Simple Grease Patty

> 1 part (by volume) solid vegetable shorting (such as Crisco)
> 2 parts (by volume) white sugar

Mix sugar and shortening until well combined. Split into approximately quarter cup (~6 centiliters) portions and store excess in the freezer sand witched between sheets of wax paper.

Grease Patty With Mineral Salt

> 2 lbs solid vegetable shorting (such as Crisco)
> 3 lbs whites sugar
> 1 lb 2:1 Syrup or High Fructose Corn Syrup or Clean Honey
> 1/3 cup pulverized mineral salt (~1/5lb Depending on mineral content)

Prepare the same as you would a simple grease patty recipe.

Grease Patty With Mineral Salt and Essential Oils

> 2 lbs solid vegetable shorting (such as Crisco)
> 3 lbs whites sugar
> 1 lb 2:1 Syrup or HFCS or Clean Honey
> 1/3 cup pulverized mineral salt (~1/5lb Depending on mineral content)
> 3 table spoons wintergreen oil

Prepare the same as you would a simple grease patty recipe.

Extender Patty

If a grease patty contains terramycin, it is called an extender patty, and is considered one of the best ways to control American Foul Brood. Some research has shown that the Terramycin will stay at strength for up to 6 months in this application. Extender Patties can be used in fall on over wintering colonies or during early spring. Extender patty use has been sanctioned by the FDA. Despite this approval, caution should still be used if taking this route of medication as spore resistance has been noted with this form of application.

> 1/3 lb powdered sugar aka Baker's Blend Sugar, not to be confused with confectioner's sugar
> 1/3 lb solid vegetable shortening (such as Crisco)

2 tablespoons Terramycin TM25

This patty can be used to eliminate three weekly dustings of powdered Terramycin, but should only be used to medicate and not as a prophylactic measure.

General Purpose Essential Oil Mixture

A well known commercially available general purpose essential oil product for bees that is similar to the following recipe claims many benefits even though many of those claims have yet to be proven. The following recipe should work about as well as that product and is way cheaper. It can be added in small quantities to feed to encourage feeding. It has been known to occasionally cause robbing behavior due to its great appeal to bees.

> 5 cups water
> 2 1/2 pounds of sugar
> 1/8 teaspoon lecithin granules (used as an emulsifier)
> 15 drops spearmint oil
> 15 drops lemongrass oil

Bring the water to a boil and stir in the sugar until it is dissolved. Once the sugar is dissolved remove the mixture from the heat and quickly add the lecithin and the essential oils. Stir the mixture thoroughly. This solution should

have a strong scent and not be left open around bees. Cool before using.

Use the Essential Oil Mixture in early spring and during periods when no nectar is available and to build up packages, nucs ind swarms. Two teaspoonfuls in a quart of 1:1 sugar syrup delivers a total of one cc of both essential oils. The essential oils are evenly distributed throughout the syrup. The Essential Oil Mixture helps produce rapid build up of bees when used as a feeding stimulant. In addition, using 4 teaspoons in a quart of one to one sugar water of the Essential Oil Mixture as a spray instead of smoke helps calm the bees, and spraying caged new queens and bees helps with queen acceptance during cage introduction and reduces balling during direct release when sprayed on new queen and bees. It also helps to reduce stings: mix a little on your hands and watch the difference in bee behavior-very few or no stings at all. Acts as a bee calmer when sprayed on the bees and helps prevent fighting when combining nucs, swarms, and colonies. Spray on a colony while doing a cut-out for some extra calm bees! When sprayed on new foundation helps encourage the bees to draw out new comb or plastic comb.

Smokeless Smoke

A solution of the above general purpose essential oil mixture and 1:1 syrup can be mixed and used in a spray bottle. This solution has varied effects depending on the specific history of the hive. Because of differences between each hive it is best to try a ten to one [1:10] mixture of essential oil mixture to syrup and vary the ratio as necessary. Have your smoker readily available during your first few trials in case the bees don't react to the solution. The bees will stay more calm when this mixture is used as compared to simply using the sugar syrup by itself to spray the bees.

Essential Oil Scent Masking Syrup

Nearly any essential oil can be mixed with a 1:1 syrup solution to mask an undesired scent in the hive. A masking syrup can be used during queen introduction or when joining two hives. Simply add the desired amount of oils to the spray bottle before using the syrup. The stronger the scent the better it will serve to mask other scents. Since essential oils have a strong smell they should be used sparingly. One of the more common oils to use is peppermint oil, but be sure not to use banana oil.

Scent Masking Syrup

A cheap scent masking syrup can be used in the same way as the recipe for essential oil scent masking syrup. Prepare a 1:1 syrup and add one or two crushed peppermint candies for every two cups of prepared solution. Load the solution into a spray bottle and use as needed.

Invert Sugar Syrup

There are times when you may find it necessary to feed your bees some sugar syrup. Feeding syrup can be done for different reasons. You may need to feed syrup to administer *fumigiln* to help your bees combat *nosema disease*. You may want to continuously feed syrup to new package to help in the production of wax and to provide an easy source of food to help the colony get established. Some beekeepers feed in the early autumn to help a colony gain extra stores for over-wintering. Some beekeepers will start feeding two or three brood cycles before the spring flow to help stimulate the queen into laying eggs. Pollinators need to feed their bees to help maintain strong populations of bees so they can fulfill the obligation of their contracts. These are just a few examples of why beekeepers feed sugar syrup to their colonies.

Different ratios of sugar syrup are fed depending on what you wish to accomplish.

A 1:2 mixture, one pound of sugar to two pints of water is used by some beekeepers as a stimulative feed to get the queen laying eggs.

Some beekeepers prefer to use a 1:1 mixture, one pound of sugar to one pint of water, for stimulative feeding. A 1:1 mixture more closely resembles nectar and stimulates the bees to build comb and provides food for the larvae.

A mixture of 2:1 , two pounds of sugar to one pint of water, is typically fed to administer medications and fed to help build winter stores.

Invert syrup **is for stimulative feeding. It breaks down the sucrose into glucose and fructose, the two main components of honey. Since it closely resembles honey by being made up of the same two components it is more easily digested by the bees and larvae and can be more readily consumed. As opposed to regular sugar syrup, invert syrup is less likely to crystallize, it retains moisture longer when used in pollen patties, helps to prevent mold, and robbing is less prevalent when invert syrup is used for feeding. Invert syrup is easy to make by simply adding some cream of tarter or lemon juice to the sugar syrup.**

To make some inverted syrup to get a 1:1 ratio simply put eight pints of water into a large pot and bring to a boil. Then slowly add eight pounds of granulated sugar to the water and stir the mixture to completely dissolve all of the sugar.

Once dissolved cream of tarter is added to the mixture. One teaspoon to one gallon of syrup is sufficient to invert the sugar in the syrup.

When using eight pints of water and eight pounds of sugar you need to add one and a half teaspoons of cream of tarter because you will end up with a gallon and a half of syrup.

When making your invert syrup it is important that you boil the mixture for twenty minutes to invert as much as the sucrose as possible. Be sure to stir the mixture a lot and don't let it sit or it will carmalize in the bottom of the pot. When done properly the invert syrup has a shelf life of up to six months so don't worry if you make extra because you have six months to give it to your bees.

For stimulative feeding, one of the most effective ways of feeding invert syrup to bees is in a one gallon pail feeder. When placed over the cluster the bees can remain in contact with the feeder when it is too cold to break the cluster and can continue to eat from the pail.

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