

# **Are All Bee Diets Created Equal?**

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## **Recent Honey Bee's Nutrition Issues**

- High annual bee Kill
- Impacts of pathogens and parasites on bee nutrition availability
- Speeding the build up of bee colonies in the spring
- Change of the cropping system to mono-sources for a short period of time vs poly sources for long period of time
- Competition of bees pollinating crops
- Moving bees for more than one crop for pollination
- Colony strength requirements for pollination





## Nutrition Requirements for Bees

- One pound of pollen would support rearing 4,000 bees (10,000 bees/1kg)
- A colony rears 200,000 bees / year, a minimum of 50 (44-88)Lbs = (20-35 kg) pollen would be required

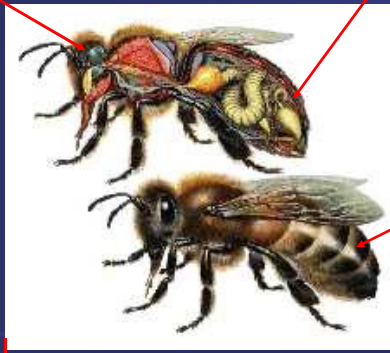


## Healthy Fed Bees

Developed  
hypopharyngeal  
glands

Enlarged fat body with  
high protein reserves

Increased  
hemolymph  
proteins,  
sugars and  
fats



Greater dry weight

## Bee Supplemental Diets

- ❑ To promote stronger and healthier colonies for honey production, commercial pollination, queen rearing, and over-wintering.
- ❑ To develop various formulations (e.g. dry, semi solid diet & patties) to provide beekeepers with alternative feeding methods.
- ❑ To improve palatability to stimulate more feeding and turn over to brood

# Additives and Honey

- ☐ Antimicrobial agents
- ☐ Stabilizers
- ☐ Emulsifiers
- ☐ Stimulants

- Would it effect honey quality?
- What residues would be left in wax?
- What would be the long term effects on bees?

# Alberta Nutrition Project

- Enhancing honey bee health in canola fields:
  - Nutritional value of various pollen patties used in Alberta
  - Nutrition requirements for colonies used for pollination
  - Feeding out doors vs indoor wintered colonies

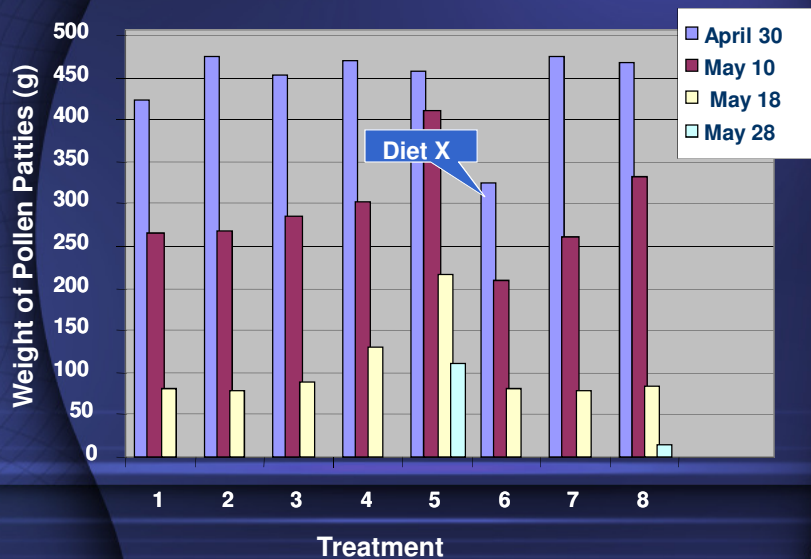
## What Happens in Spring?

- Pollen/protein stores required by colonies to initiate mid or late - winter brood rearing
- Supplies can be depleted before pollen is available from the environment

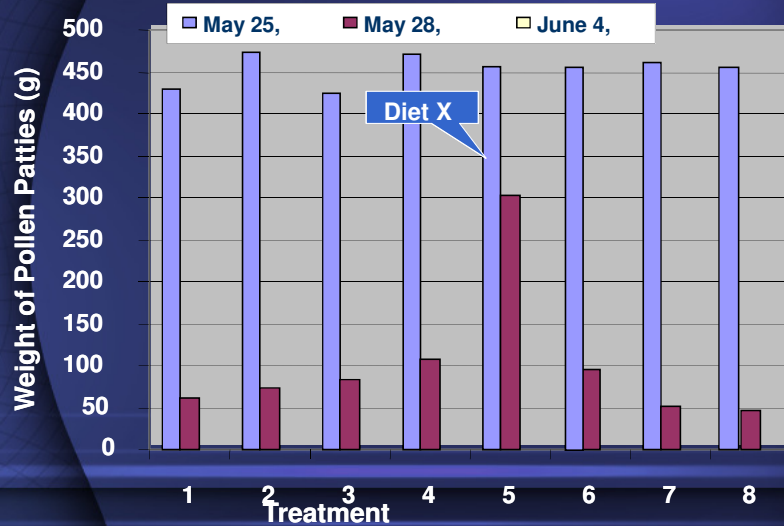


- This is a critical period of colony growth

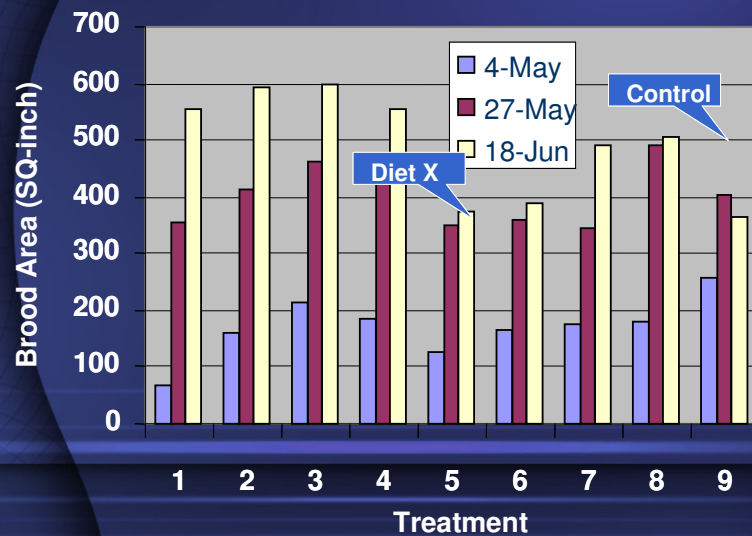
## Pollen Patties Consumption Feeding- 1, Spring 2014



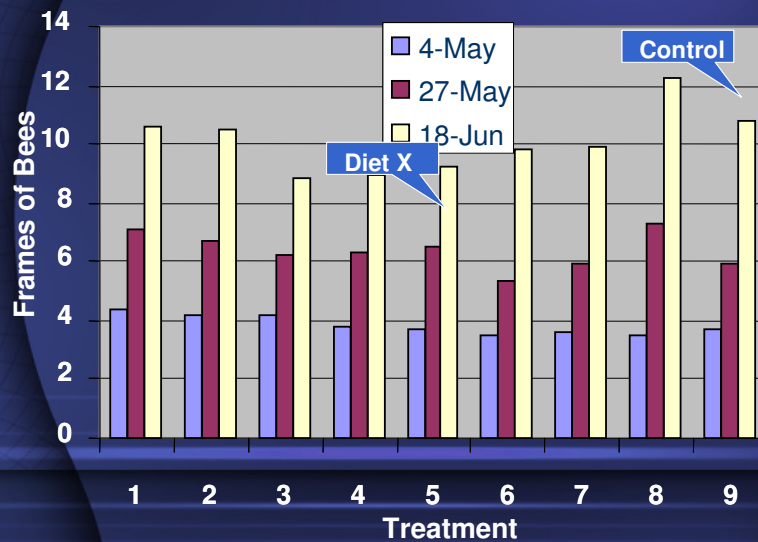
## Pollen Patties Consumption Feeding- 2- Spring (2014)



## Effects of Feeding Pollen Patties on Brood Area- Spring 2014



## Effects of Feeding Pollen Patties on Frames of Bees Spring 2014

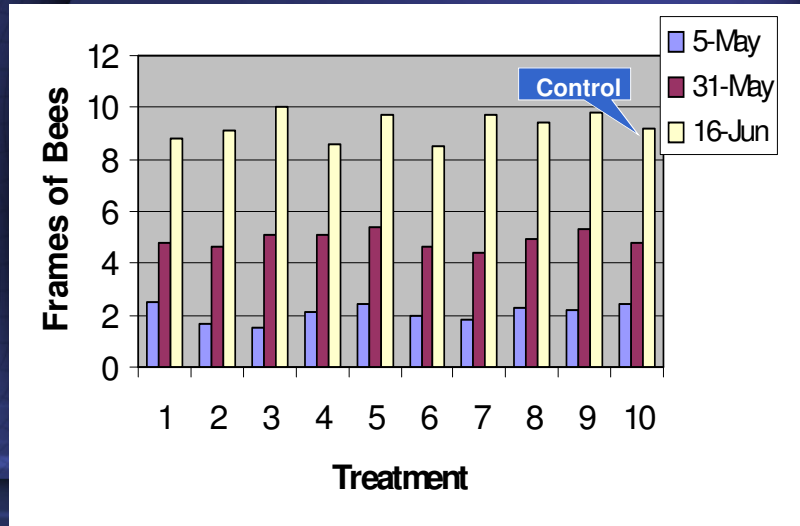


## Summary of Feeding Pollen Supplement in 2014

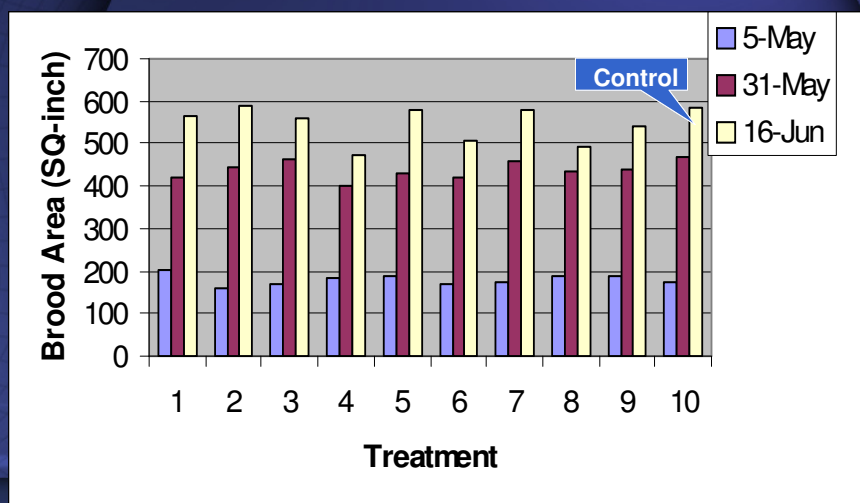
- Brood production increased by as much as 1/3<sup>rd</sup>.
- Pollen feeding increased worker dry body weight and amount of brood
- Bees did not feed on much of Diet X



## Effects of Feeding Pollen Patties on Frames of Bees, Spring 2015



## Effects of Feeding Pollen Patties on Brood Area- Spring 2015



## Effects of Feeding Pollen Supplements on Honey Bees 2016

### - Tested Diets:

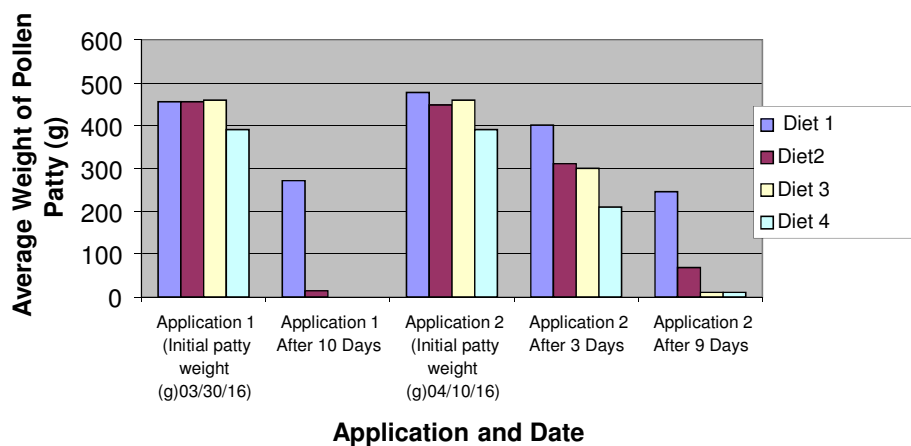
- Diet 1
- Diet 2
- Diet 3
- Diet 4
- Control

### - Experimental design

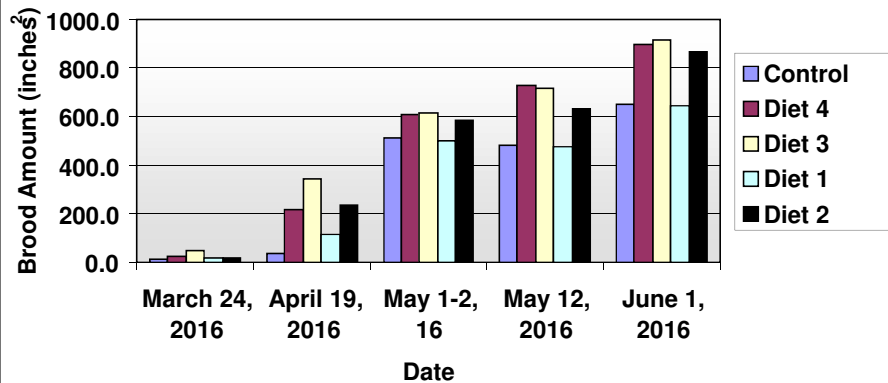
- 10 Hives /diet Double boxes
- 10 Hives /diet single box



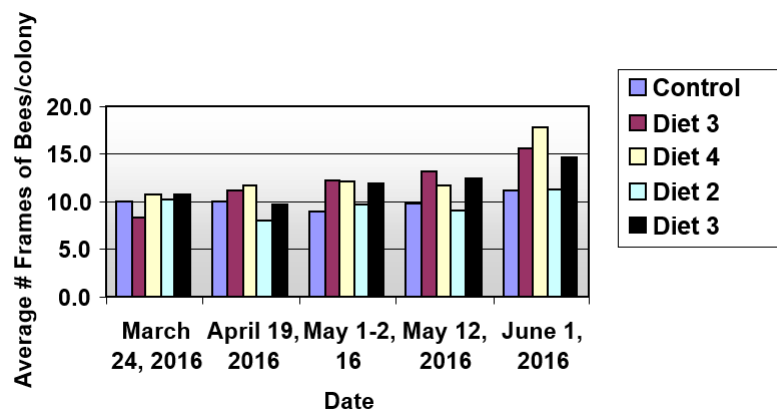
### Patty Consumption for Application 1 and 2 in Yard 1 Out Door Colonies



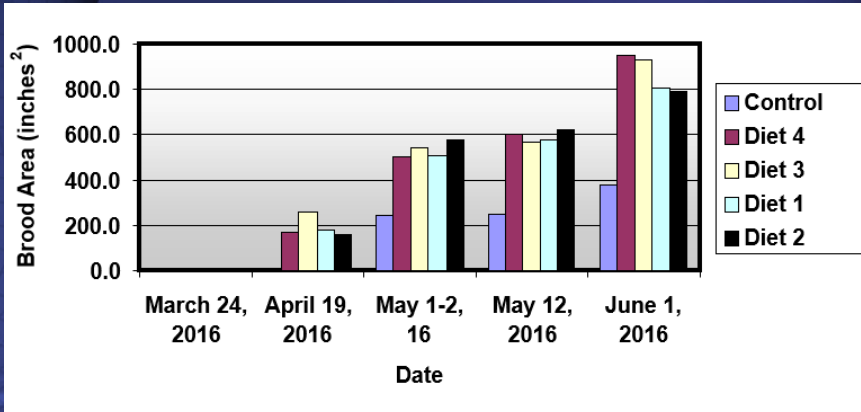
## Average Brood Area / Colony in Apiary 1 in 2Brood Chambers Colonies Over-Wintered Outdoors in 2016



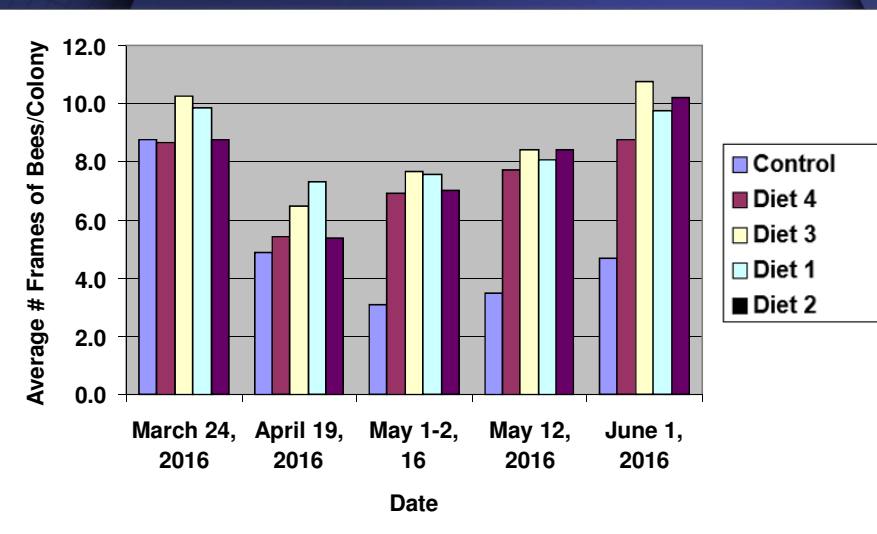
## Average Number of Frames Covered with Bees/ Colony in Apiary 1 in 2Brood Chambers Colonies Over-Wintered Outdoors



## Average Brood Area / Colony in Apiary 2 in 1Brood Chamber Nucs Over-Wintered Indoors in 2016



## Average Number of Frames Covered with Bees/ Colony in Apiary 2 in 1Brood Chamber Nucs Over-Wintered Indoors in 2016





## 2016 SUMMARY

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- ➔ Supplemental feeding is important for colony build up in Southern Alberta.
- ➔ No significant differences when feeding Diet, 1,3 & 4, on brood production.
- ➔ Feeding any of the 3 tested diets significantly increased the brood production in comparison to Diet 2 and Control
- ➔ Brood area increased by 250 Square Inches (= 6500 Bees)
- ➔ Bees wintered in doors eatr almost all diets regardless

**Do we need to feed every year?**

## THREE YEAR SUMMARY

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- Brood rearing was boosted in the spring (mid-March to May) in supplemented colonies
- In 1 of 3 springs, this boost was insignificant
- In 2 of 3 springs, the effects of feeding on rearing and honey yield were lost by June
- Sometimes... but no way to predict the season!

IS FEEDING WORTH IT?

