

BioActivity Analysis of California HONEY Samples ~ 2025~



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UTSA_HoneyPathway



nextgen



The sweetest stuff



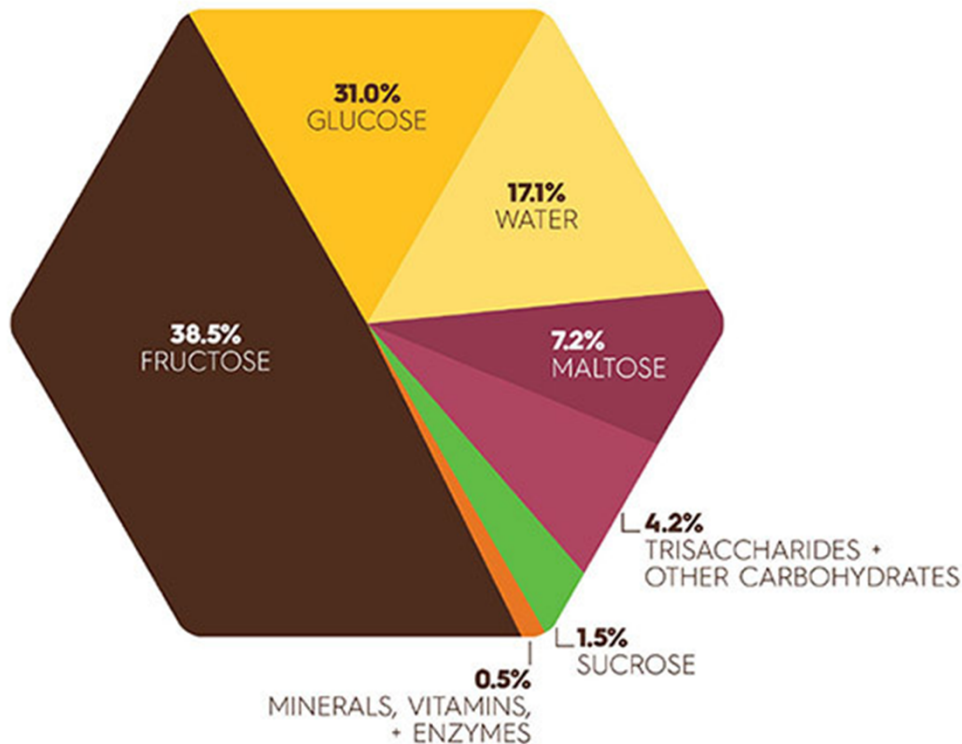
Honey



HONEY

A Natural **Therapeutic** Agent

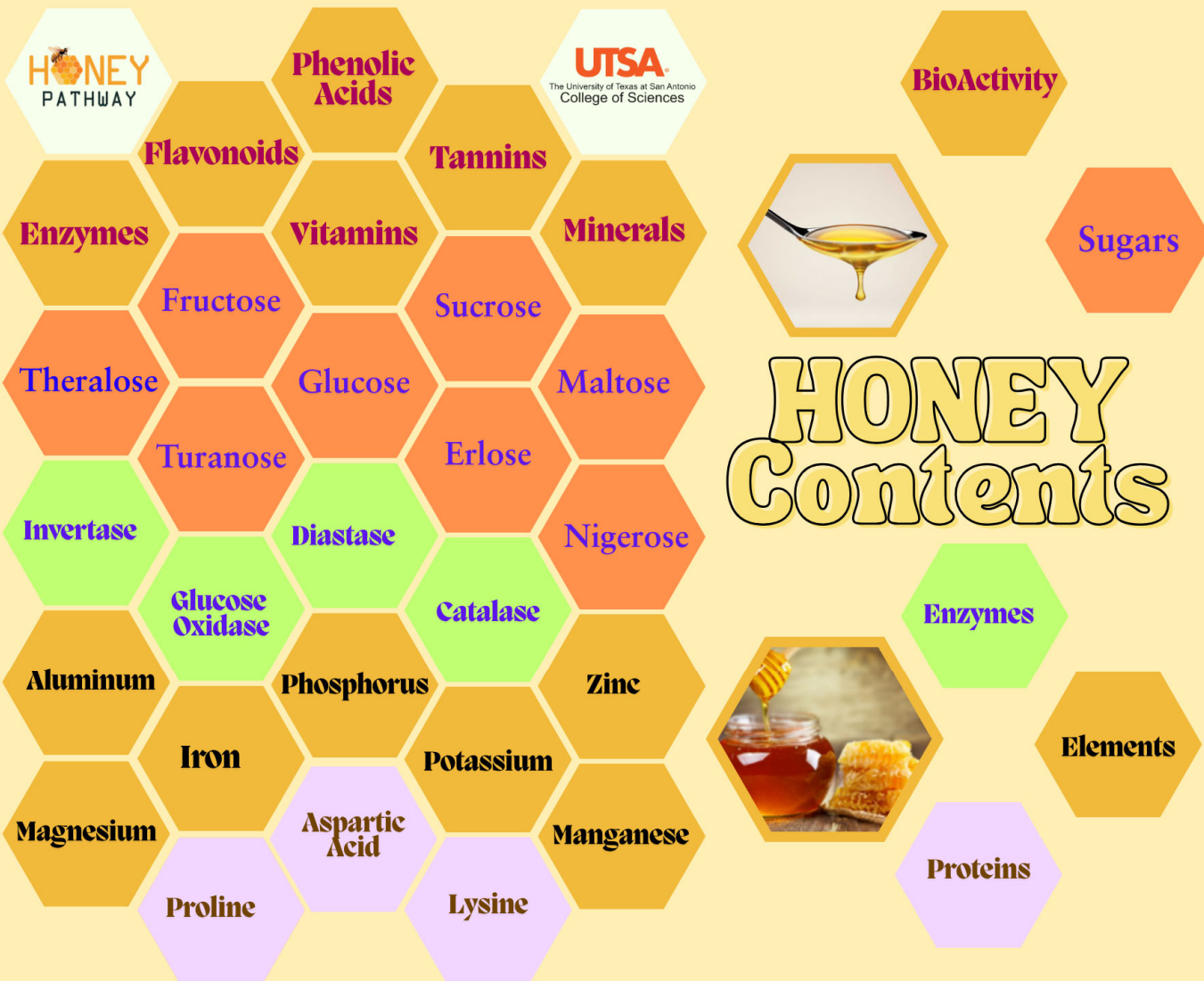
HONEY'S NUTRITIONAL PROFILE

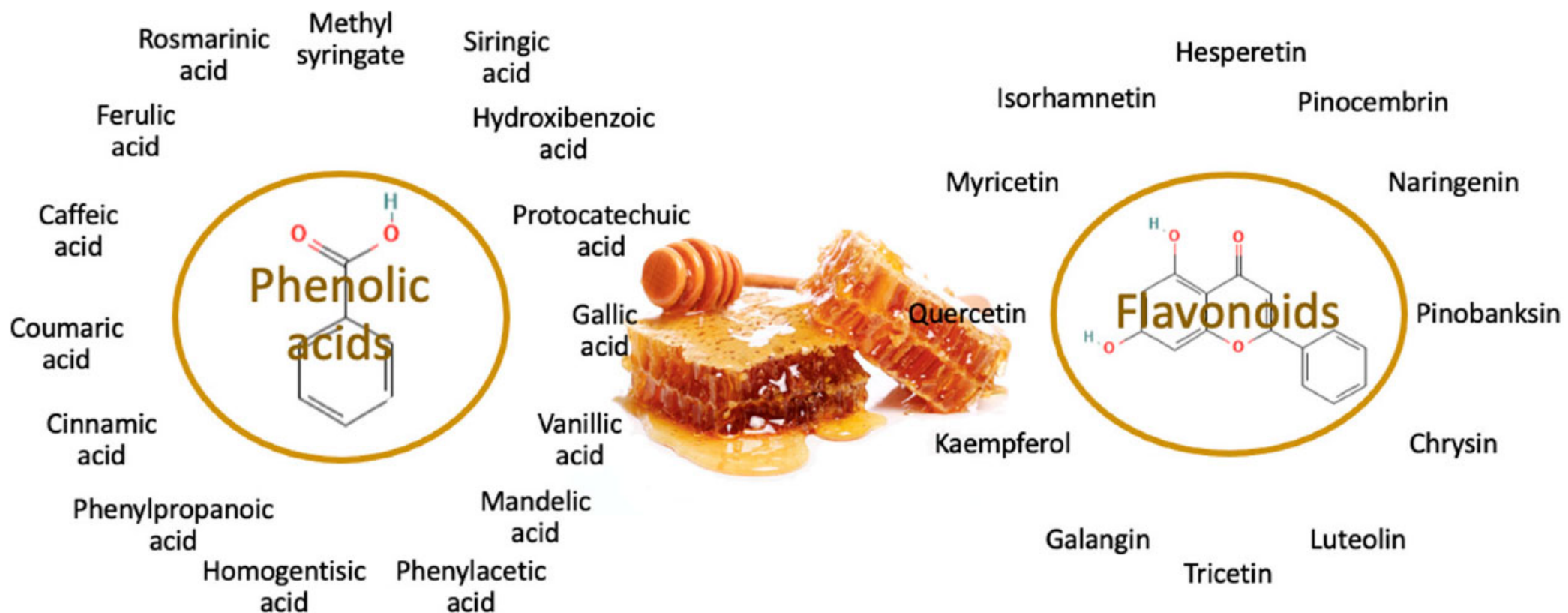


Honey can contain over 3500 compounds, being broadly comprised of

- **amino acids,**
- **vitamins,**
- **minerals,**
- **enzymes,**
- **flavonoids,**
- **phenolic acids, and**
- **antioxidants.**





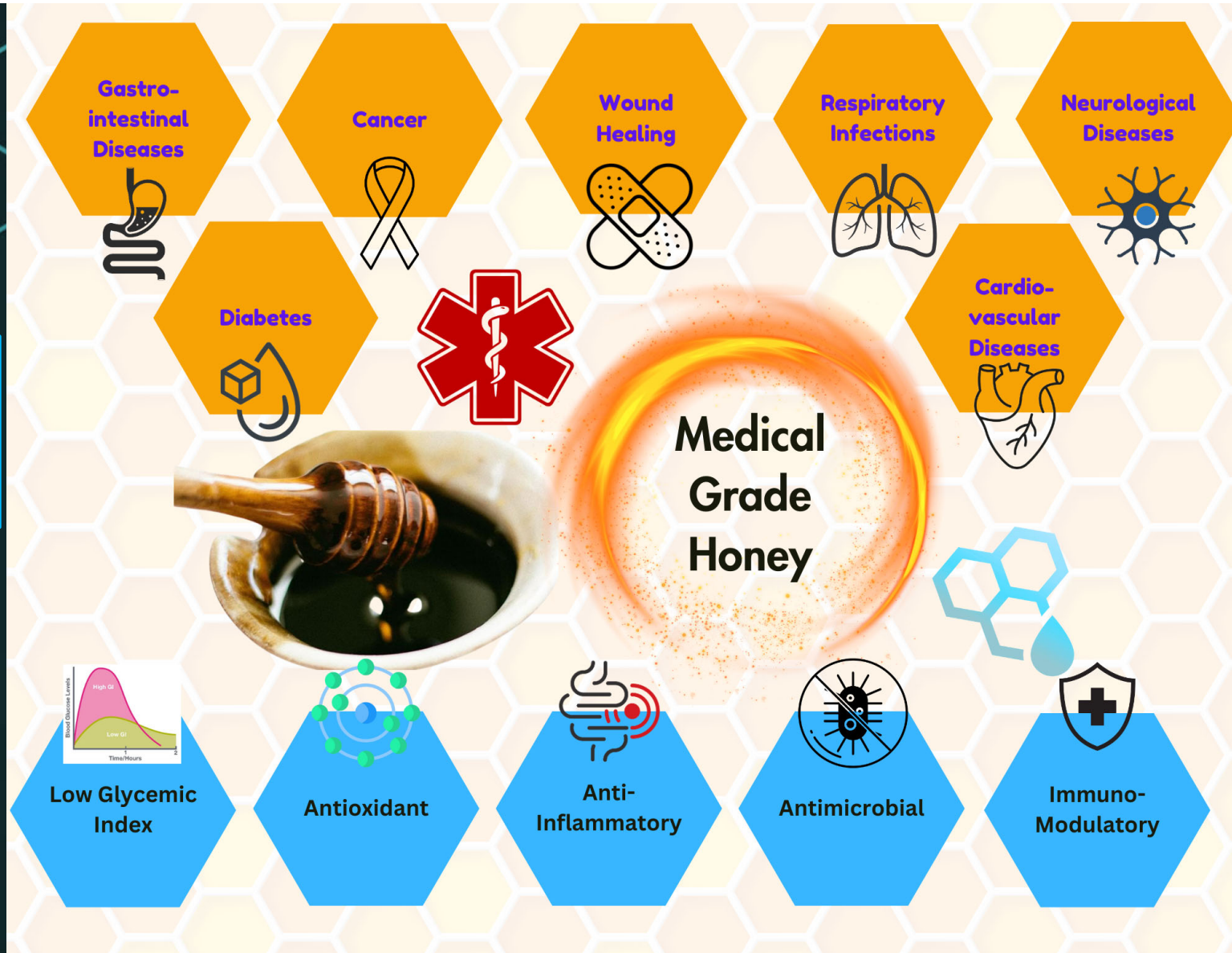


A Comprehensive Review of the Effect of Honey on Human Health

by Marta Palma-Morales ^{1,2} , Jesús R. Huertas ^{1,3} and Celia Rodríguez-Pérez ^{1,2,4,*}



Honey is Medicine





Honey Bioactivity

BOX 1. ANTIMICROBIAL EFFECT OF HONEY

The antimicrobial effect of honey is achieved through a range of factors:

- A low moisture content deprives bacteria of water and therefore prevents growth
- A high sugar content extracts water from bacteria by osmosis
- A low pH inhibits bacterial growth
- Production of hydrogen peroxide by the action of the enzyme glucose oxidase, when honey is diluted with wound exudate; the hydrogen peroxide breaks down, releasing low concentrations of reactive oxygen, destroying invading microbes and promoting healing
- The presence of bee defensin 1, an antimicrobial peptide passed to the honey from the bee's immune system, is thought to disrupt the bacterial cell membrane
- The presence of the antimicrobial methylglyoxal - manuka honey contains up to 100 times higher concentrations of methylglyoxal than other honeys

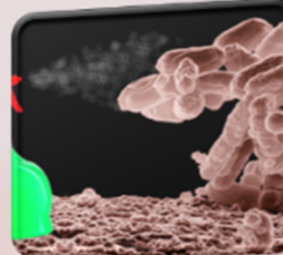
Honey as an Antibacterial Agent



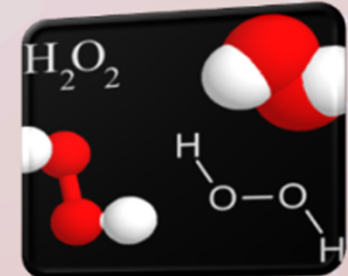
High Sugar
Concentration
(76%)



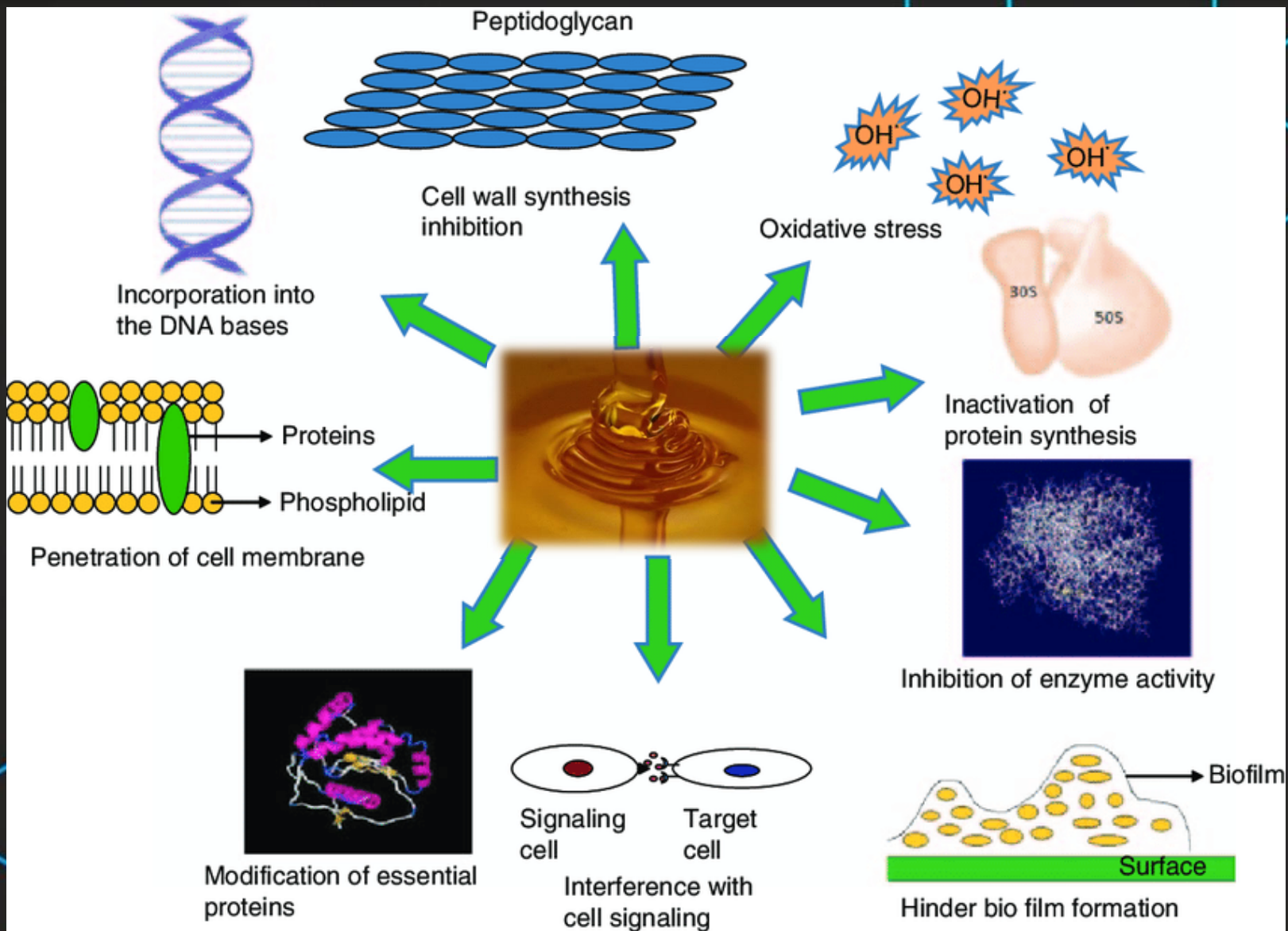
Acidity
(pH 3.6)



Organic
Antibacterial
Compounds



Hydrogen
Peroxide
(H_2O_2)



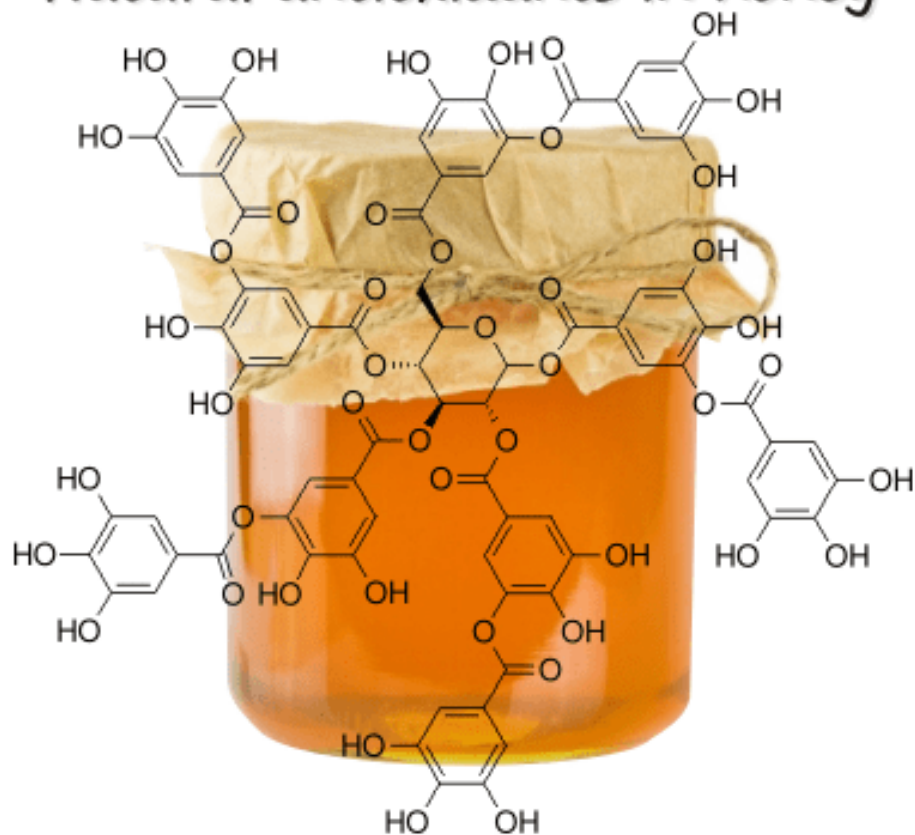
Adapted from

Rajni Singh, M S Smitha,
Surinder P Singh

**The role of nanotechnology in
combating multi-drug resistant
bacteria**

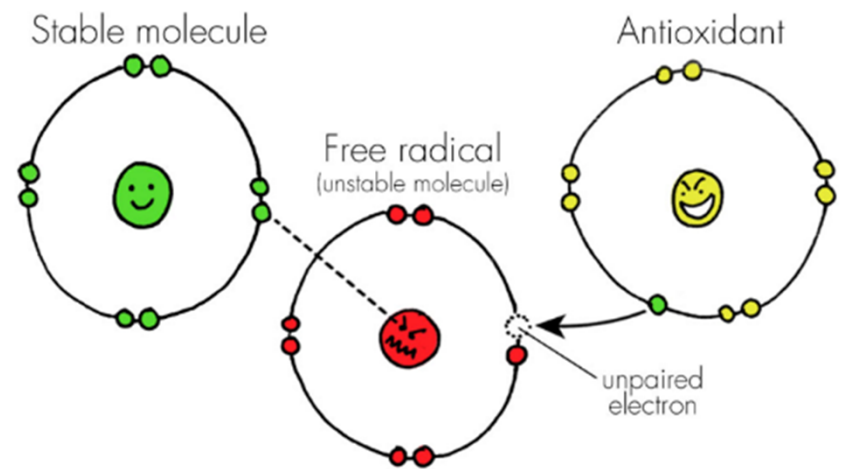
J Nanosci Nanotechnol
2014 Jul;14(7):4745-56.
doi: 10.1166/jnn.2014.9527.

Natural antioxidants in honey



keep us healthy and young!

Honey as an Antioxidant Agent

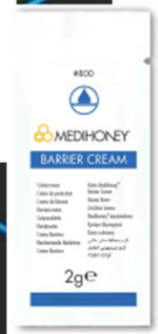




Honey in the Medical Market

Table. Medical Grade Honey (MGH) wound care products currently available on the market

Product name	Manufacturer	Honey type	MGH content	Sterilization method	Certification	Supplements
Activon	Advancis	Manuka	100%	Gamma irradiation	FDA & CE	-
L-Mesitran	Triticum	Organic	40 and 48%	Gamma irradiation	FDA & CE	Vitamins C and E, zinc oxide, essential oils
Manuka Fill	Links Medical Products Inc.	Manuka	100%	Gamma irradiation	FDA & CE	-
Medihoney	Derma Sciences	Manuka	80%	Gamma irradiation	FDA & CE	-
Melladerm Plus	SanoMed Manufacturing	Polyfloral	45%	Ozonation	CE	Vitamins C and E, glucose oxidase
Principelle IF	Principelle	Dark buckwheat	n.a.	Gamma irradiation	CE	Minerals, trace elements, oxides
Revamil	Bfactory Health Products	Polyfloral	100%	Gamma irradiation	CE	-
Surgihoney	Matoke Holdings	Any honey	100%	Heated	CE	Glucose oxidase
Therahoney	Medline	Manuka	100%	Gamma irradiation	FDA	-
Vivamel	Tosama	Chestnut	100%	Gamma irradiation	CE	-
Meletus	Melipharm	Mix of monoflorals	100%	Gamma irradiation	CE	-



- Hydrogel
- Hydrocolloid
- Alginate
- Paste
- Ointment
- Gel

MGH Wound Products



- Hydrogel
- Hydrocolloid
- Alginate
- Paste
- Ointment
- Gel

MGH Wound Products



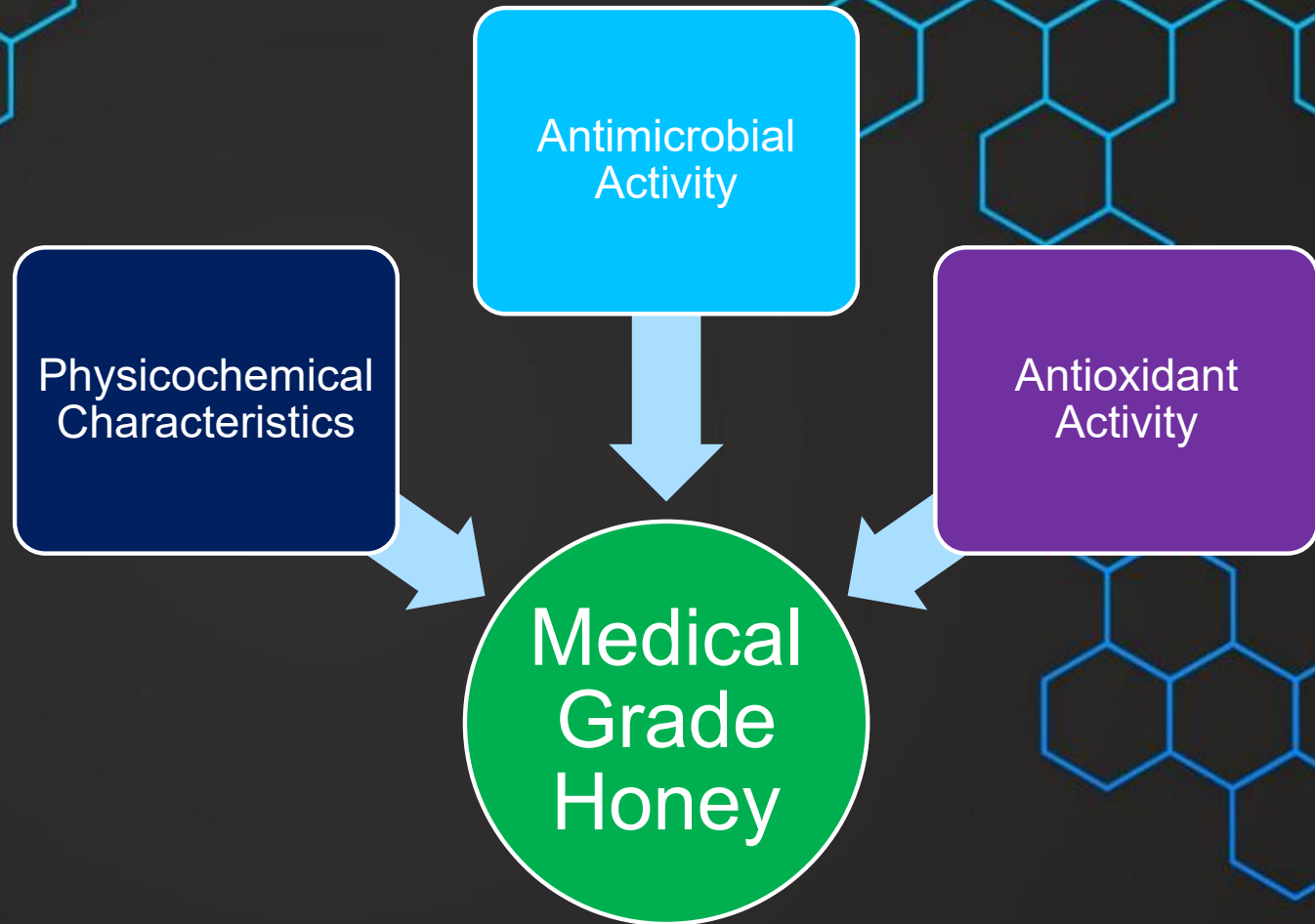


- Collagen-based
- Hydrogel

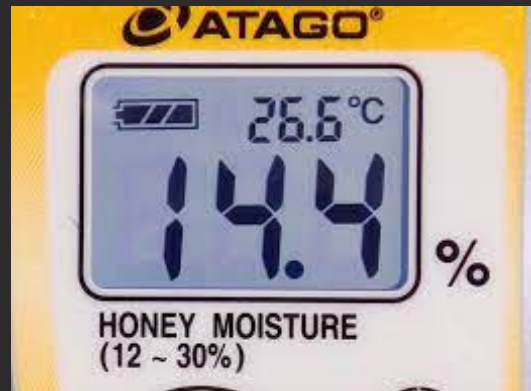
MGH Wound Products



How to Identify Medical Grade Honey?

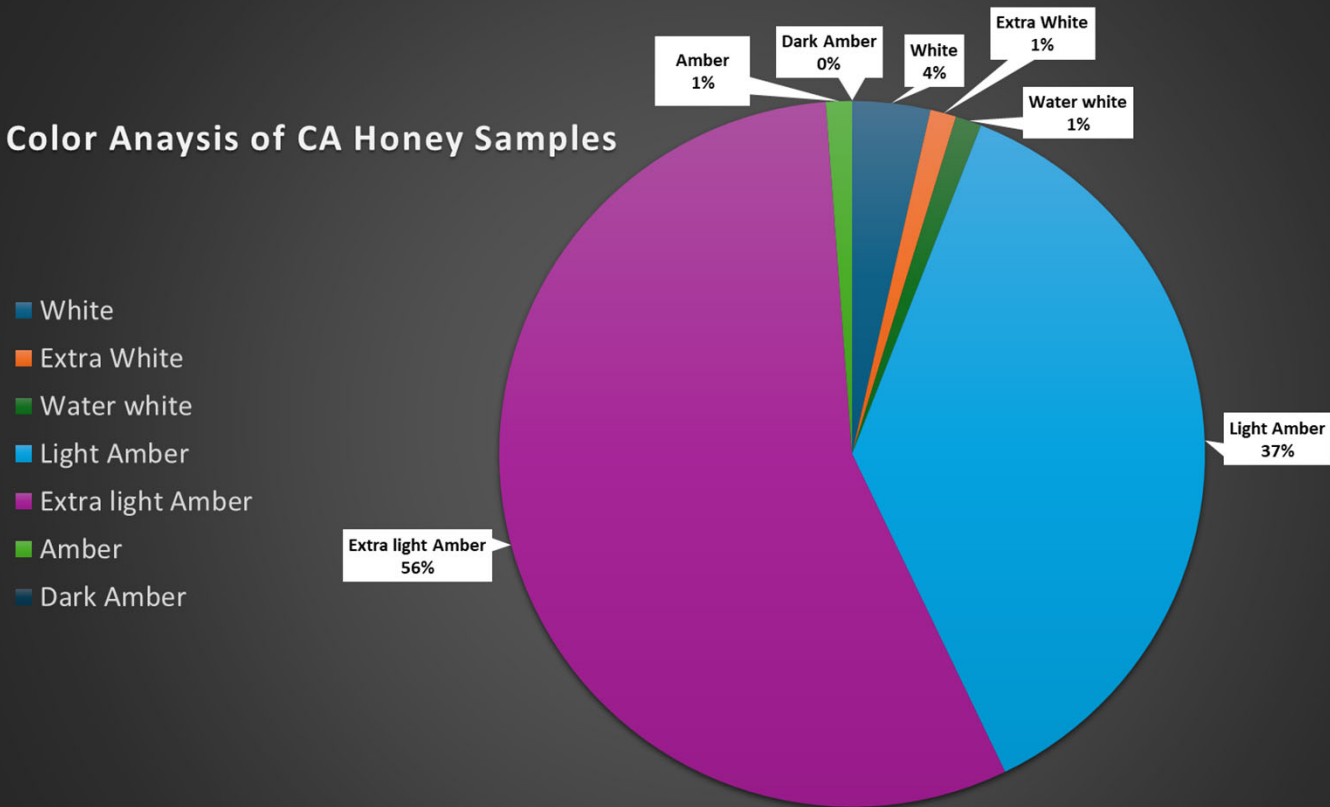


Physicochemical Analyses

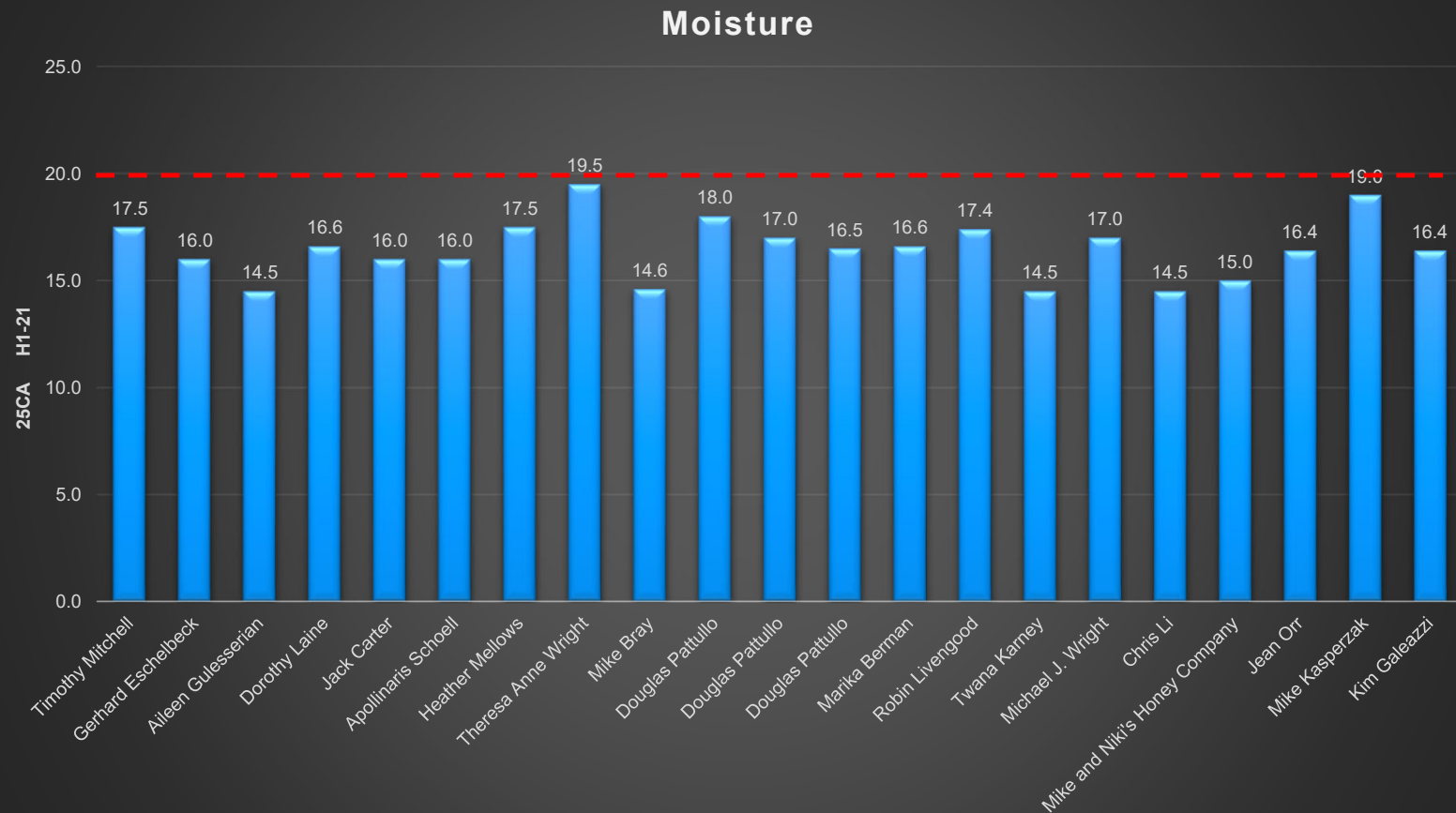


Color Analysis of CA Honey- 2025

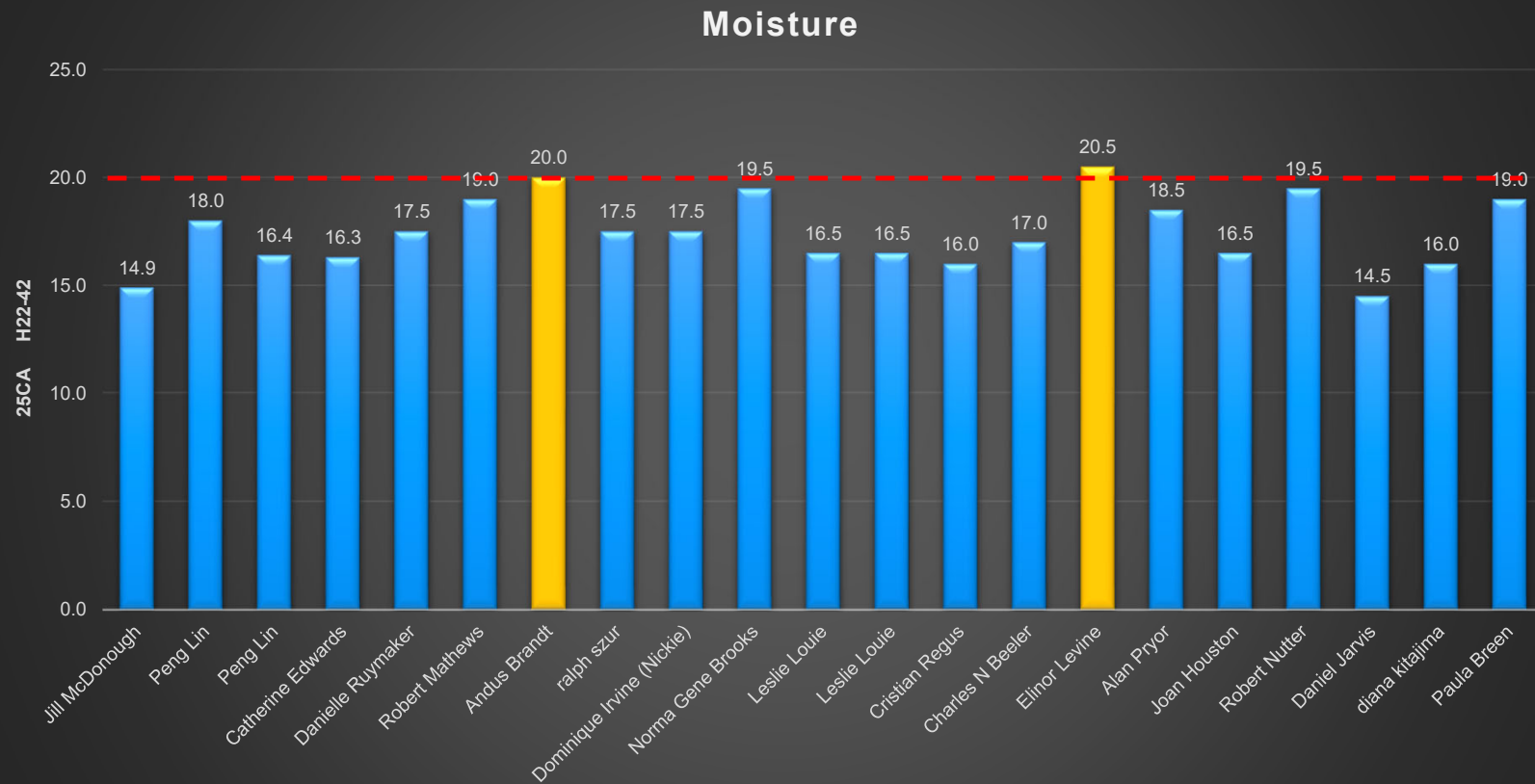
Color Anaysis of CA Honey Samples



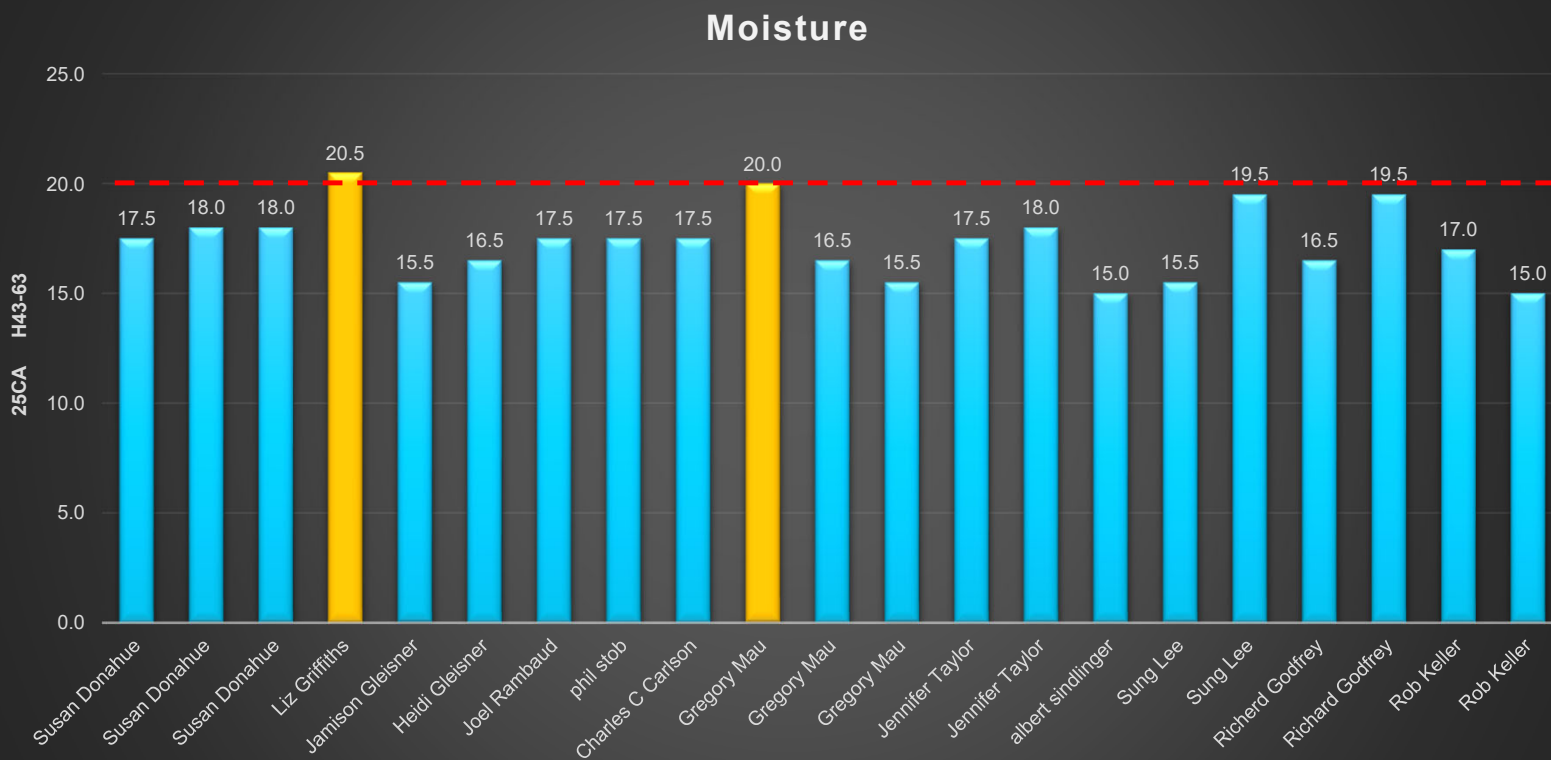
Moisture Analysis of CA Honey Samples- 2025



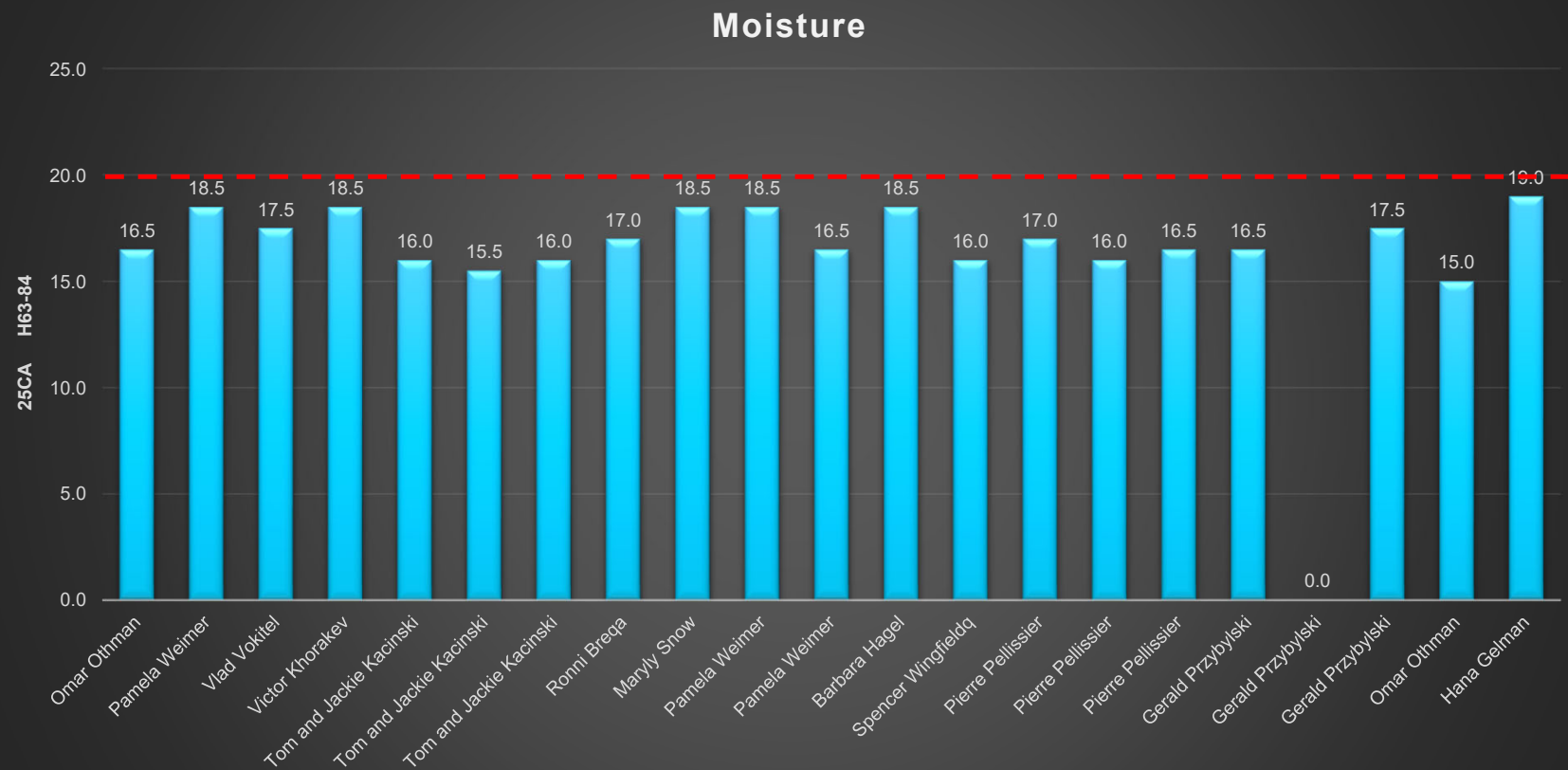
Moisture Analysis of CA Honey Samples- 2025



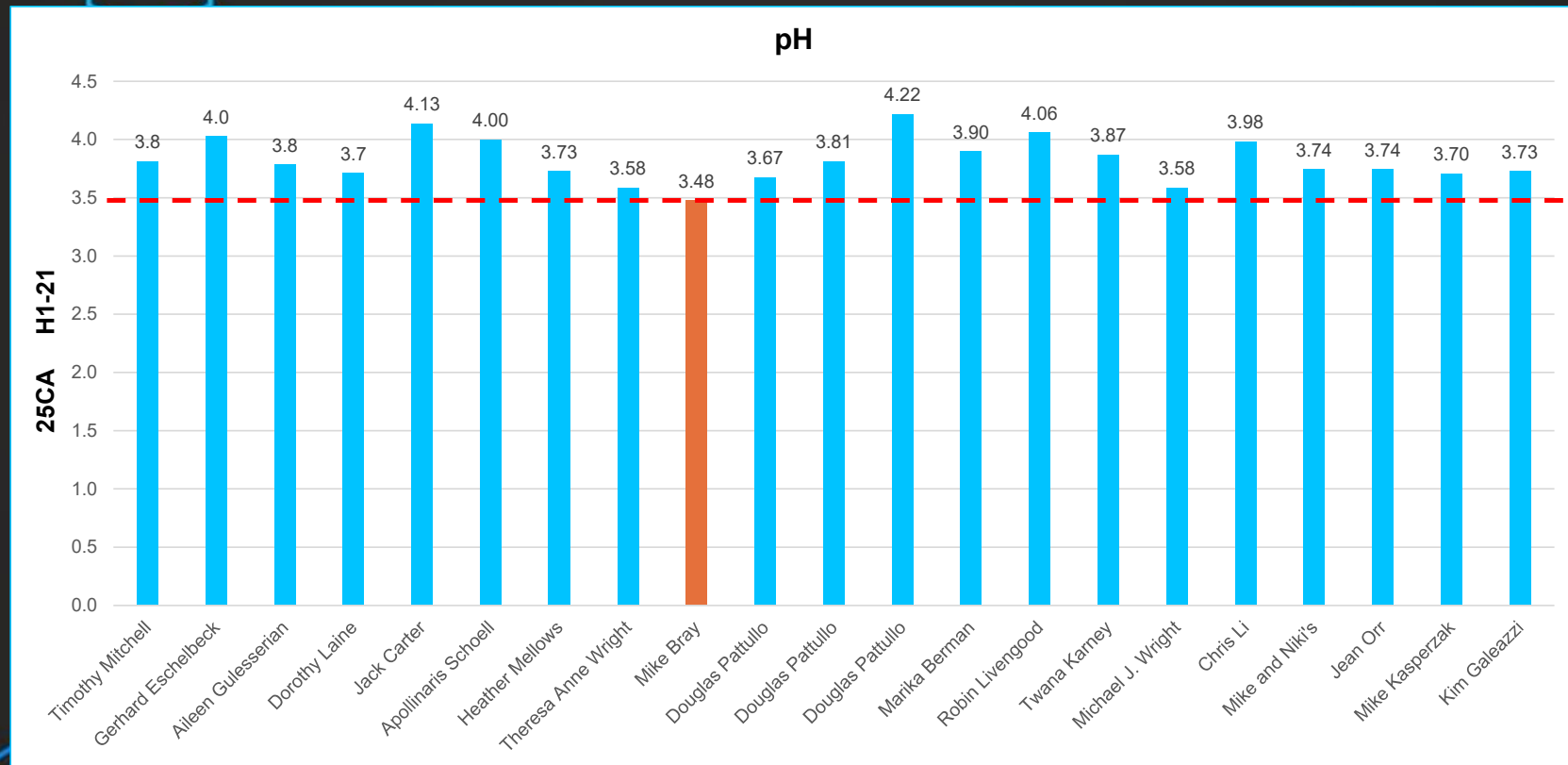
Moisture Analysis of CA Honey Samples- 2025



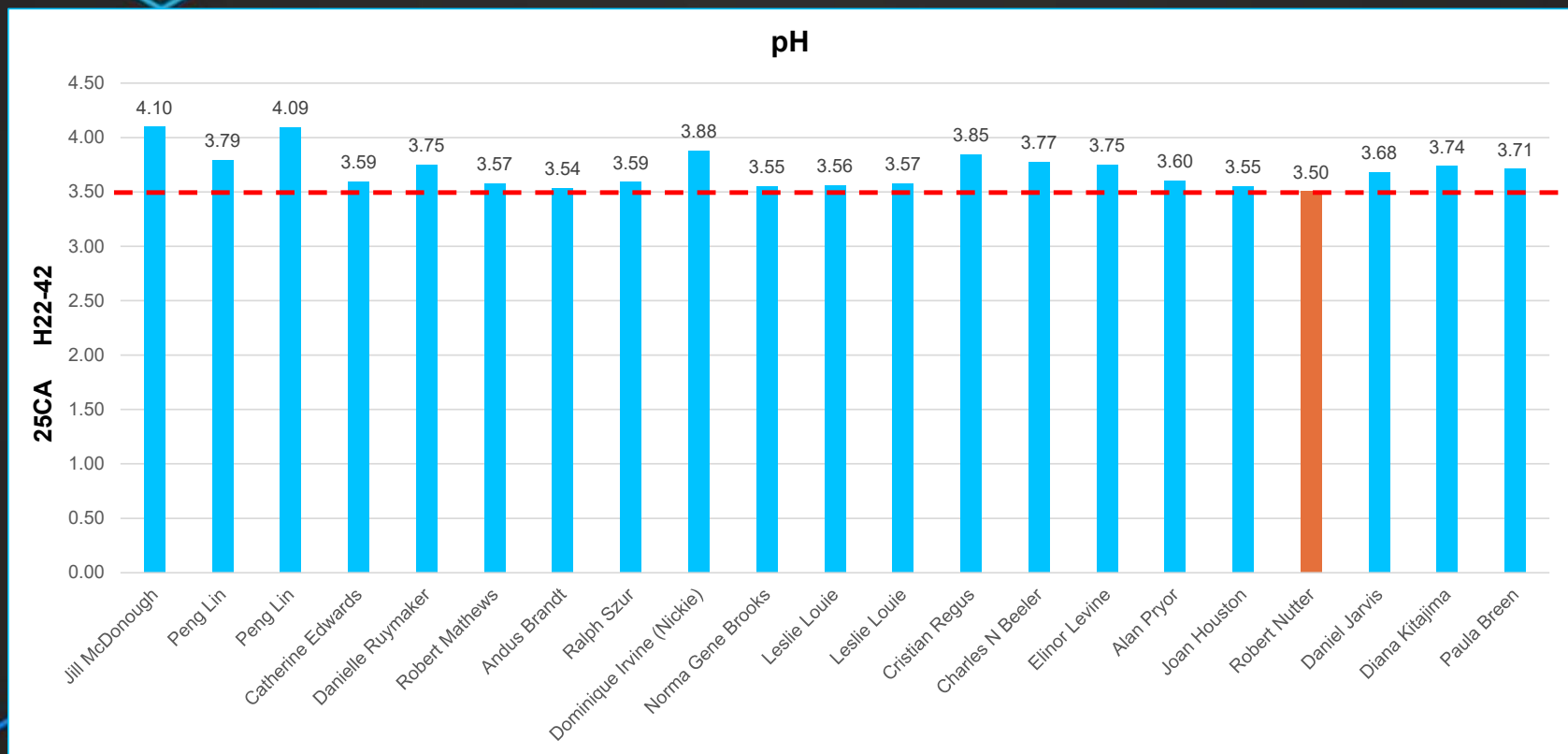
Moisture Analysis of CA Honey Samples- 2025



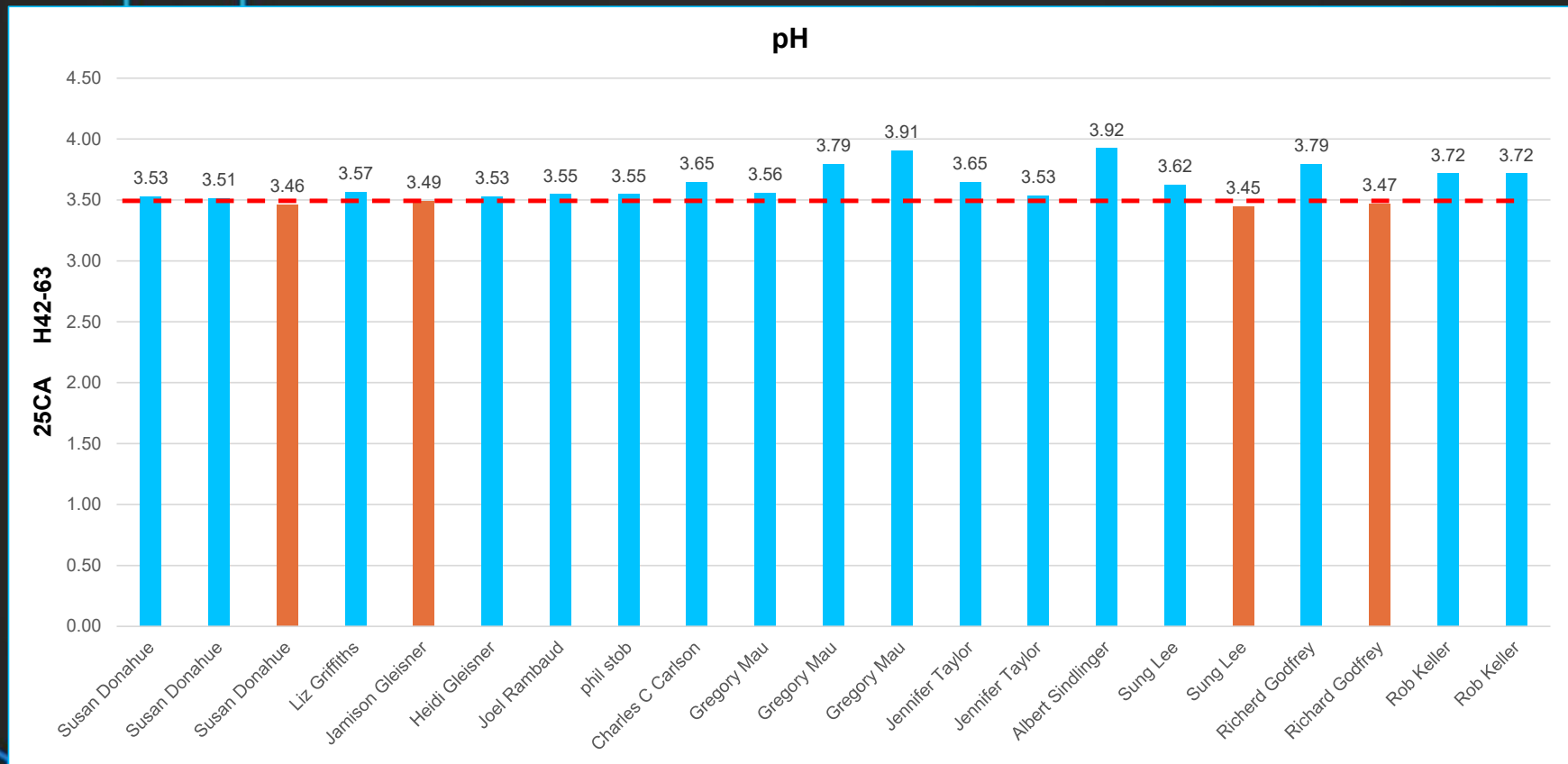
pH Analysis of CA Honey Samples- 2025



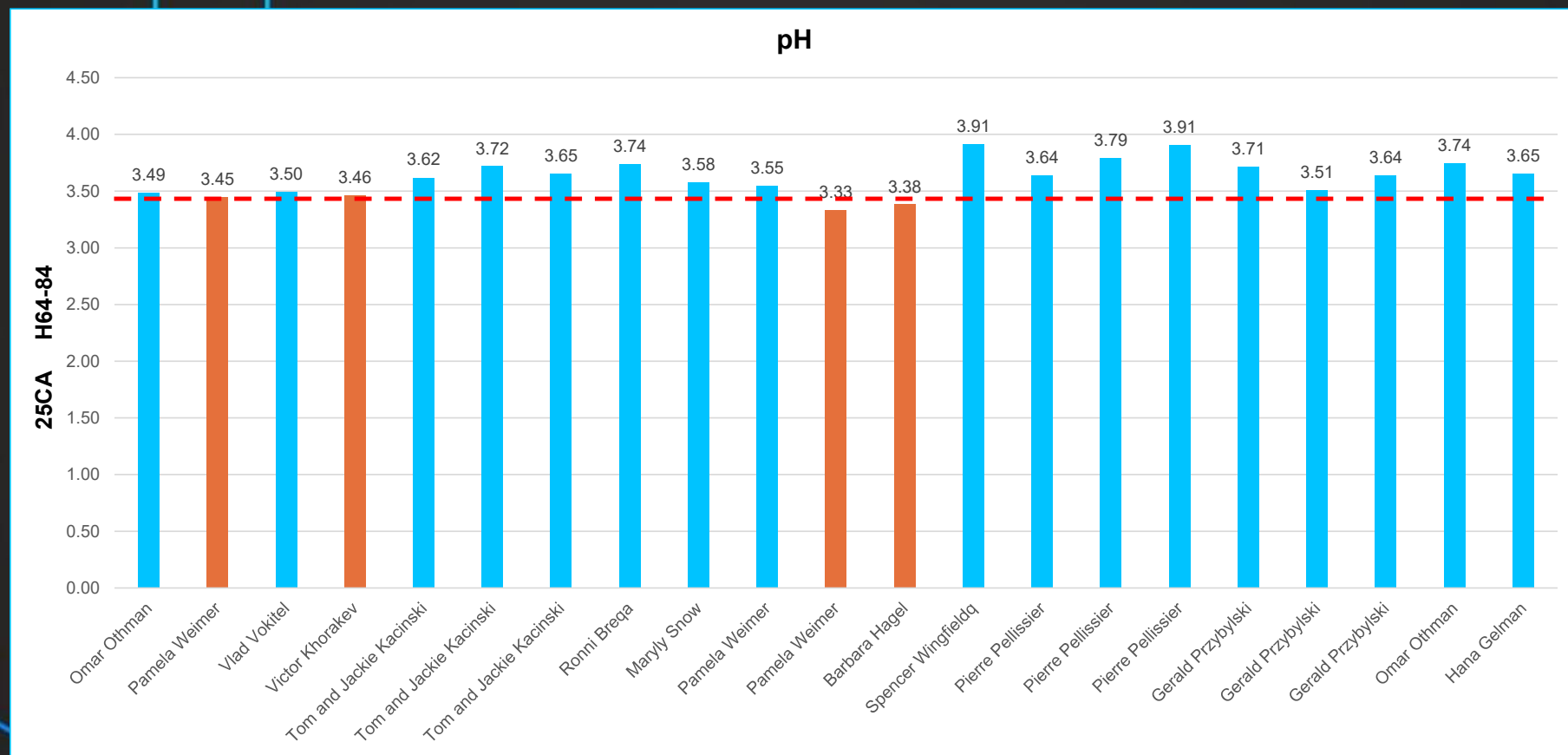
pH Analysis of CA Honey Samples- 2025



pH Analysis of CA Honey Samples- 2025



pH Analysis of CA Honey Samples- 2025



Antimicrobial Analysis of Honey

Agar Well
Diffusion Assay

Hydrogen
Peroxide
Activity

XTT
Metabolic
Assay

Cell
Proliferation
and Viability

Disk Diffusion
Assay

Prevention of
Biofilm Formation



Nosocomial (Hospital) Infections

TYPES

MOST COMMON:
STAPHYLOCOCCUS AUREUS



OTHER COMMON PATHOGENS:
ESCHERICHIA COLI
ENTEROCOCCI
CANDIDA



PREVENTION



**FREQUENT
HAND HYGIENE**



**PROPER
PPE USE**



**APPROPRIATE
ANTIMICROBIAL USE**



**ROUTINE
DISINFECTION**



**REMOVE
INDWELLING
DEVICES ASAP**

CAUSES



URINARY CATHETERS
↳ URINARY TRACT INFECTIONS

SURGICAL PROCEDURES
↳ SURGICAL SITE INFECTIONS

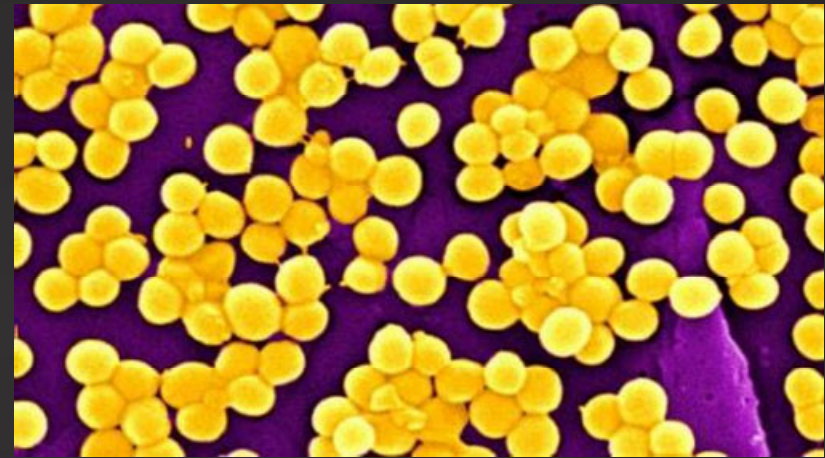
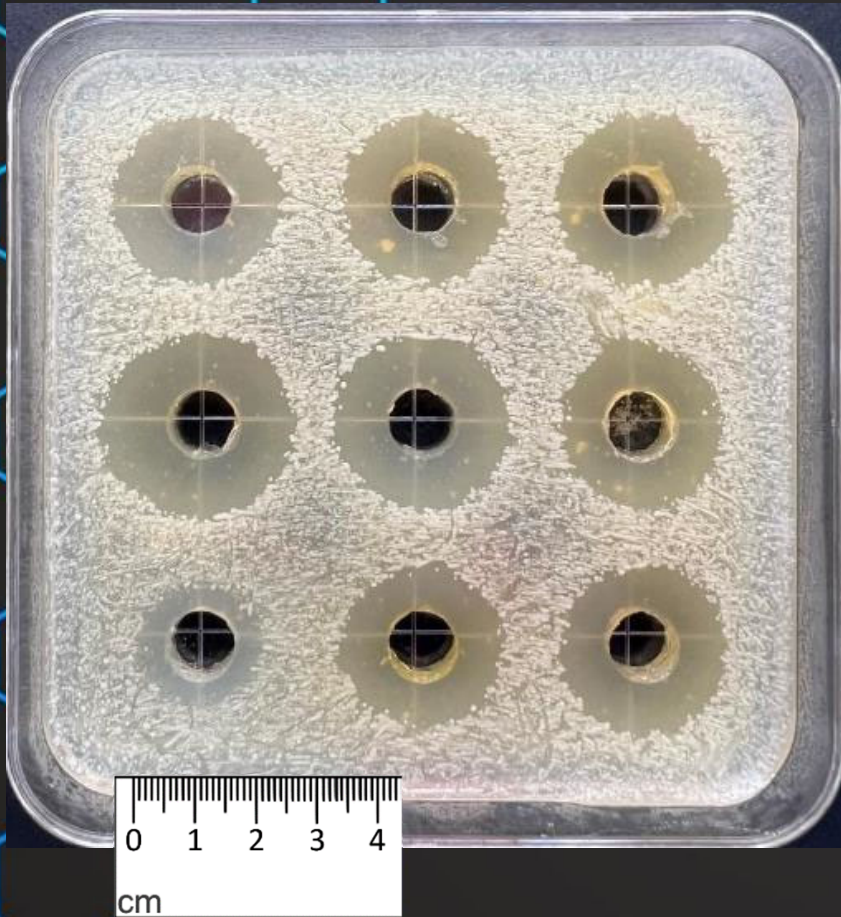


CENTRAL VENOUS CATHETERS
↳ BLOODSTREAM INFECTIONS

MECHANICAL VENTILATION
↳ PNEUMONIA



Agar Well Diffusion Assay of Honey



Staphylococcus aureus

Zone of Inhibition (Zoi)

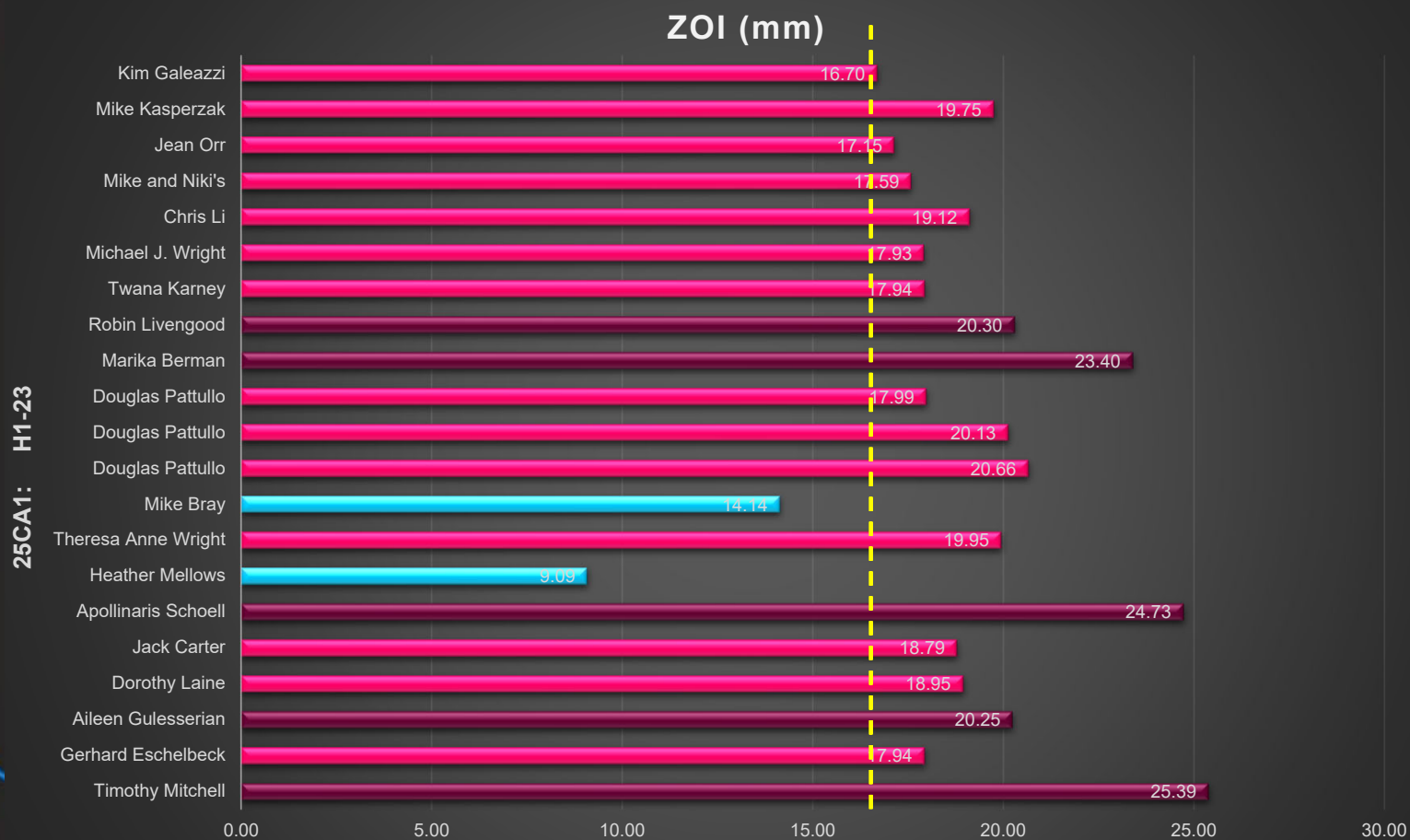
Weak: < 11 mm

Moderate: ≤ 16 mm

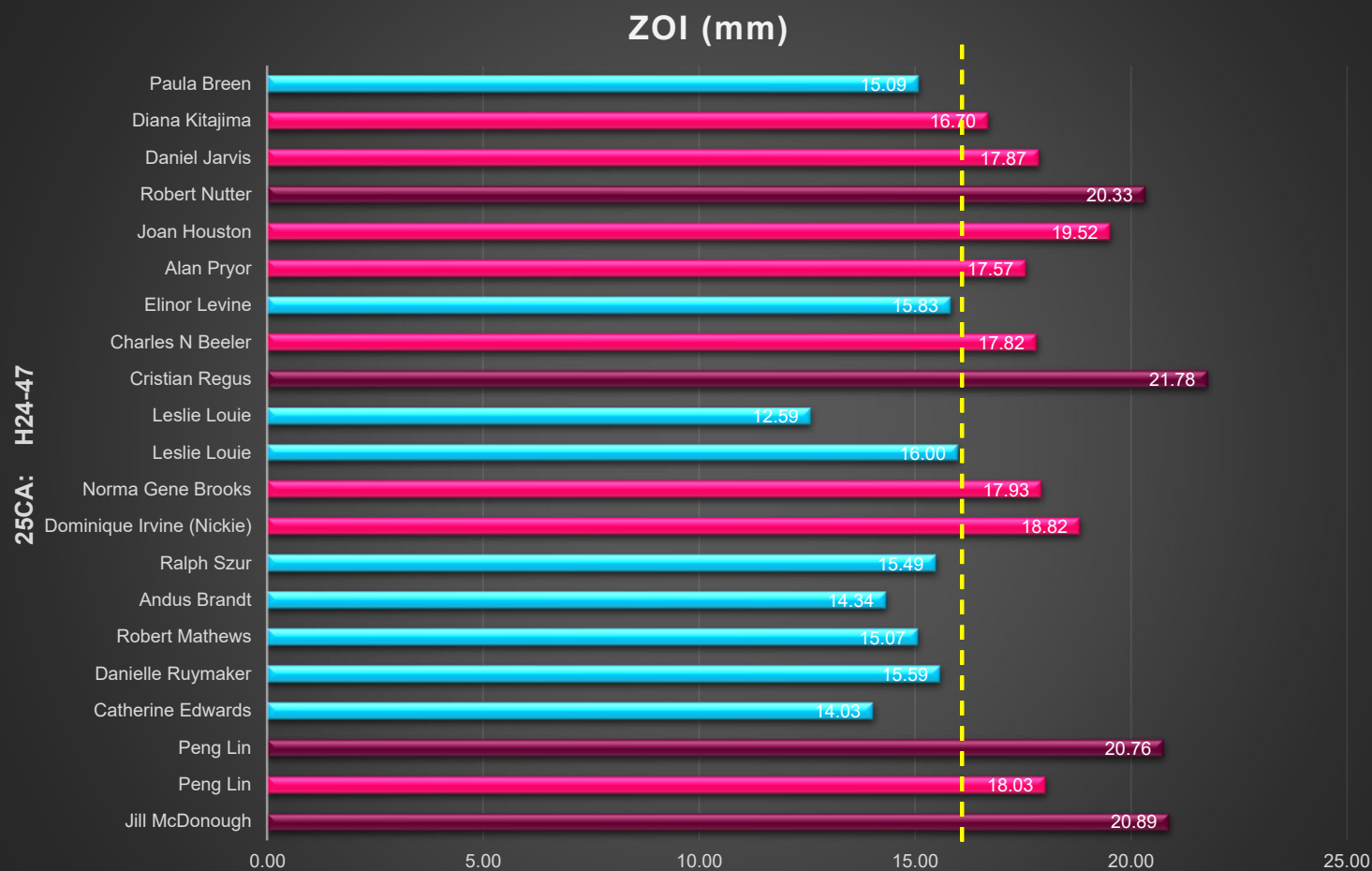
Strong: > 16 mm



Antimicrobial Activity of CA Honey Samples- 2025



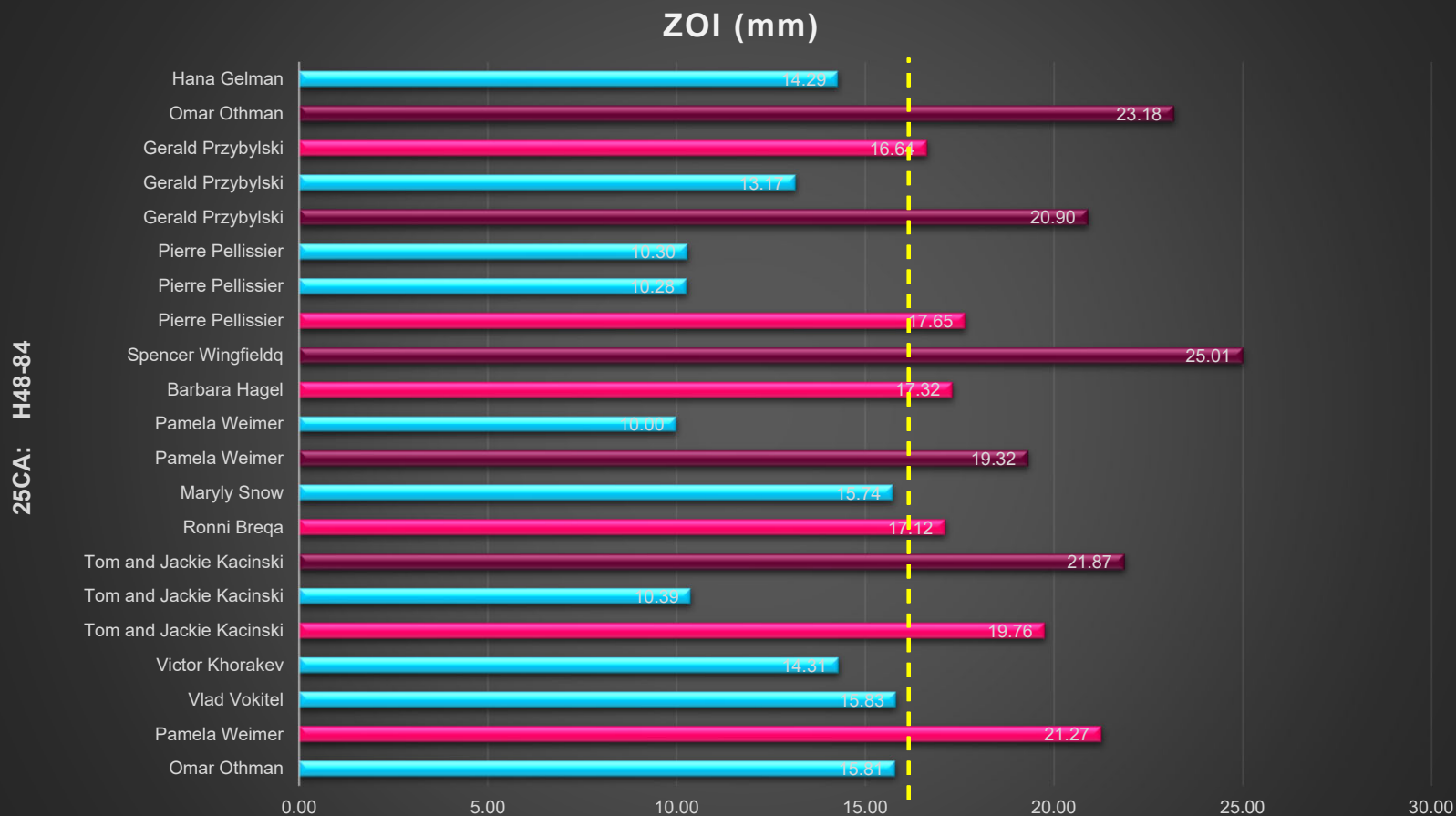
Antimicrobial Activity of CA Honey Samples- 2025



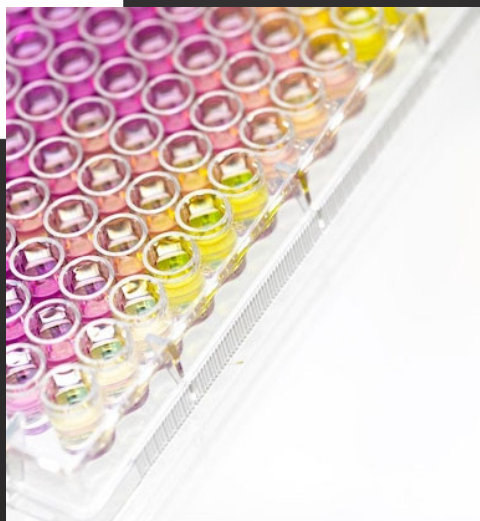
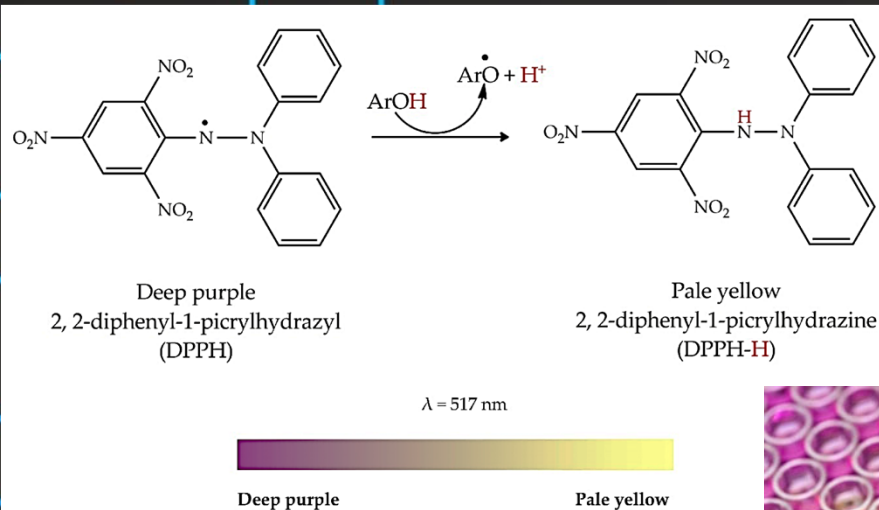
Antimicrobial Activity of CA Honey Samples- 2025



Antimicrobial Activity of CA Honey Samples- 2025

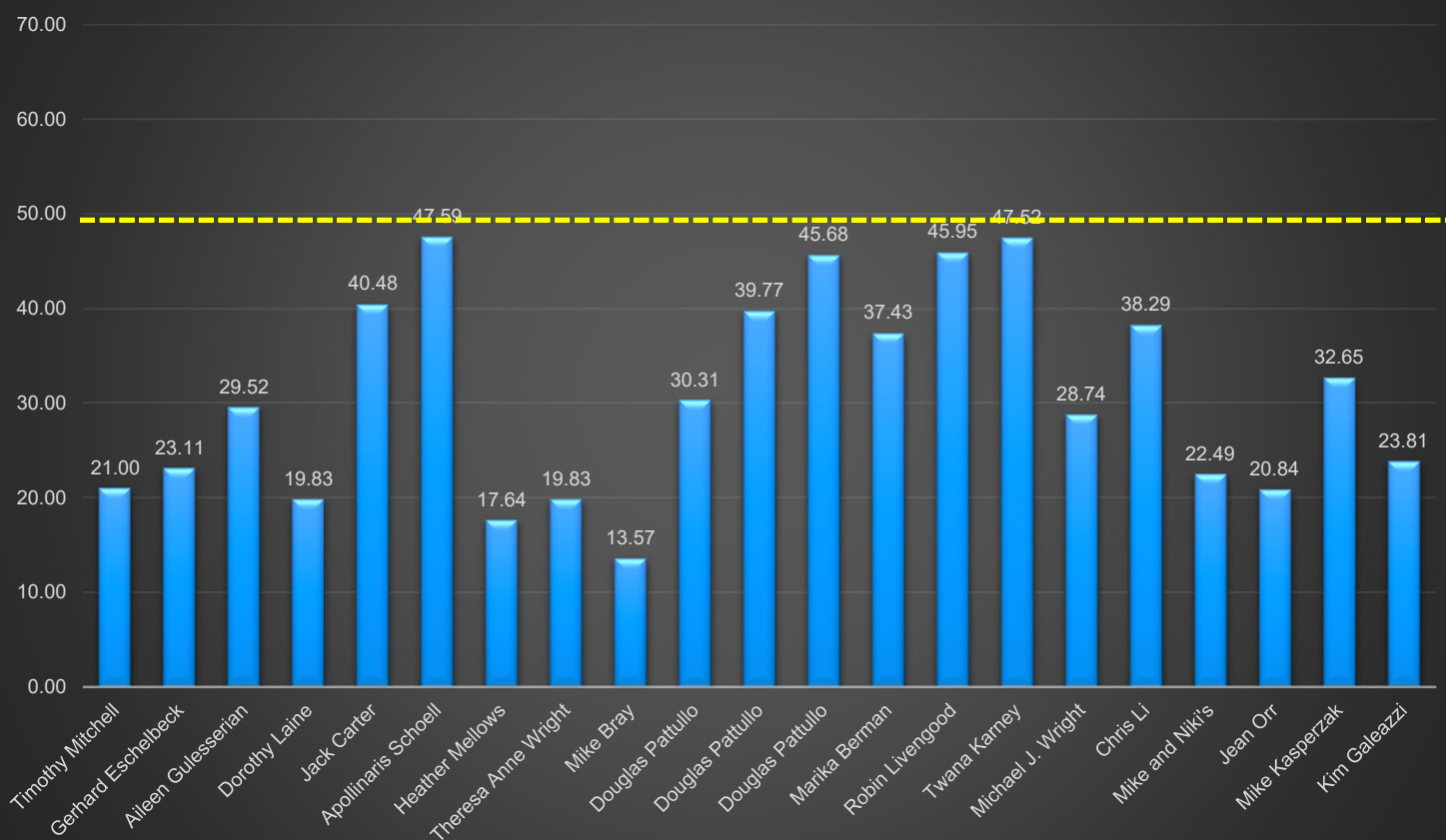


Antioxidant Analysis of TX Honey



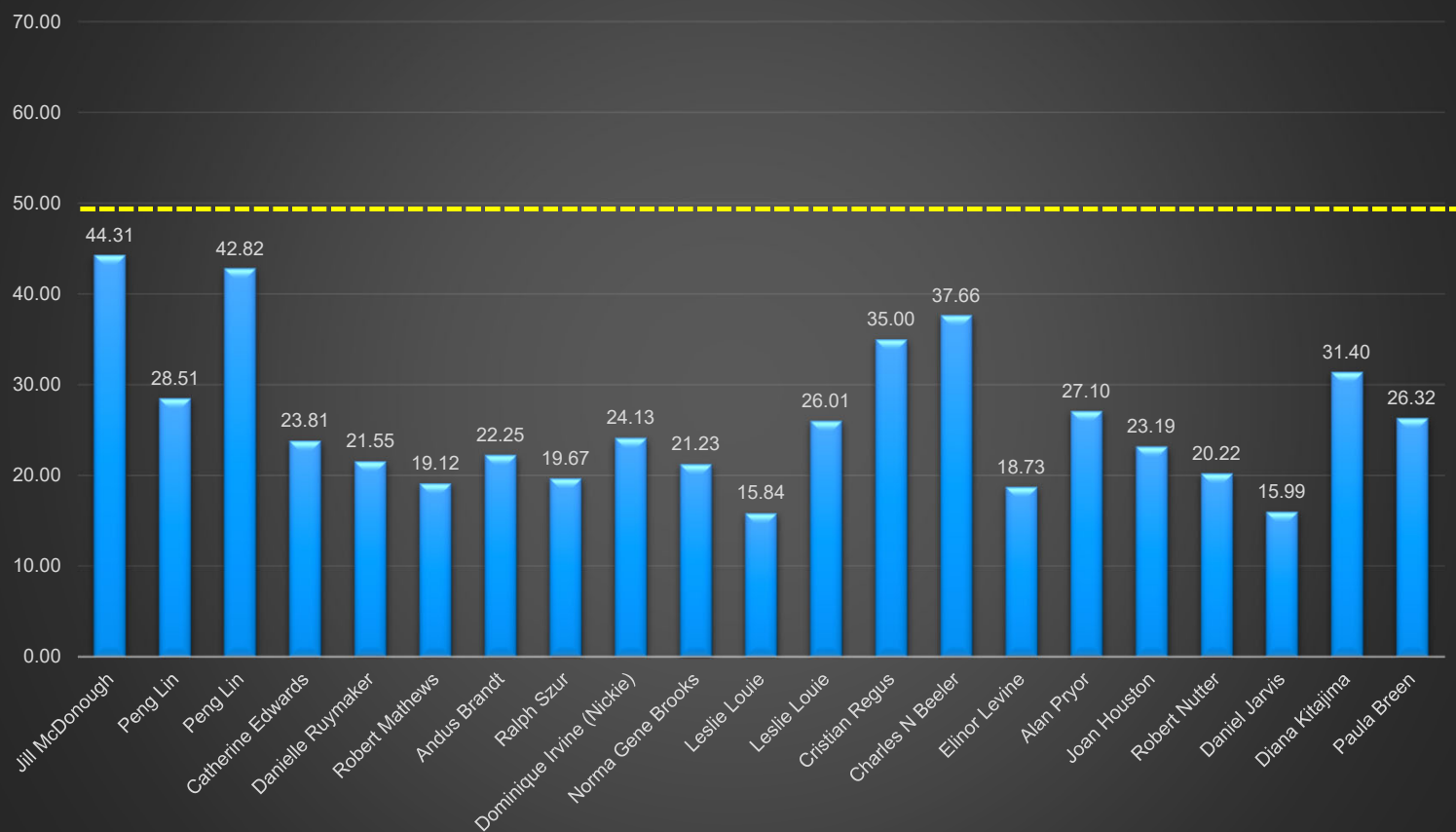
Antioxidant Activity of CA Honey Samples- 2025

DPPH - Radical Scavening Activity (%)

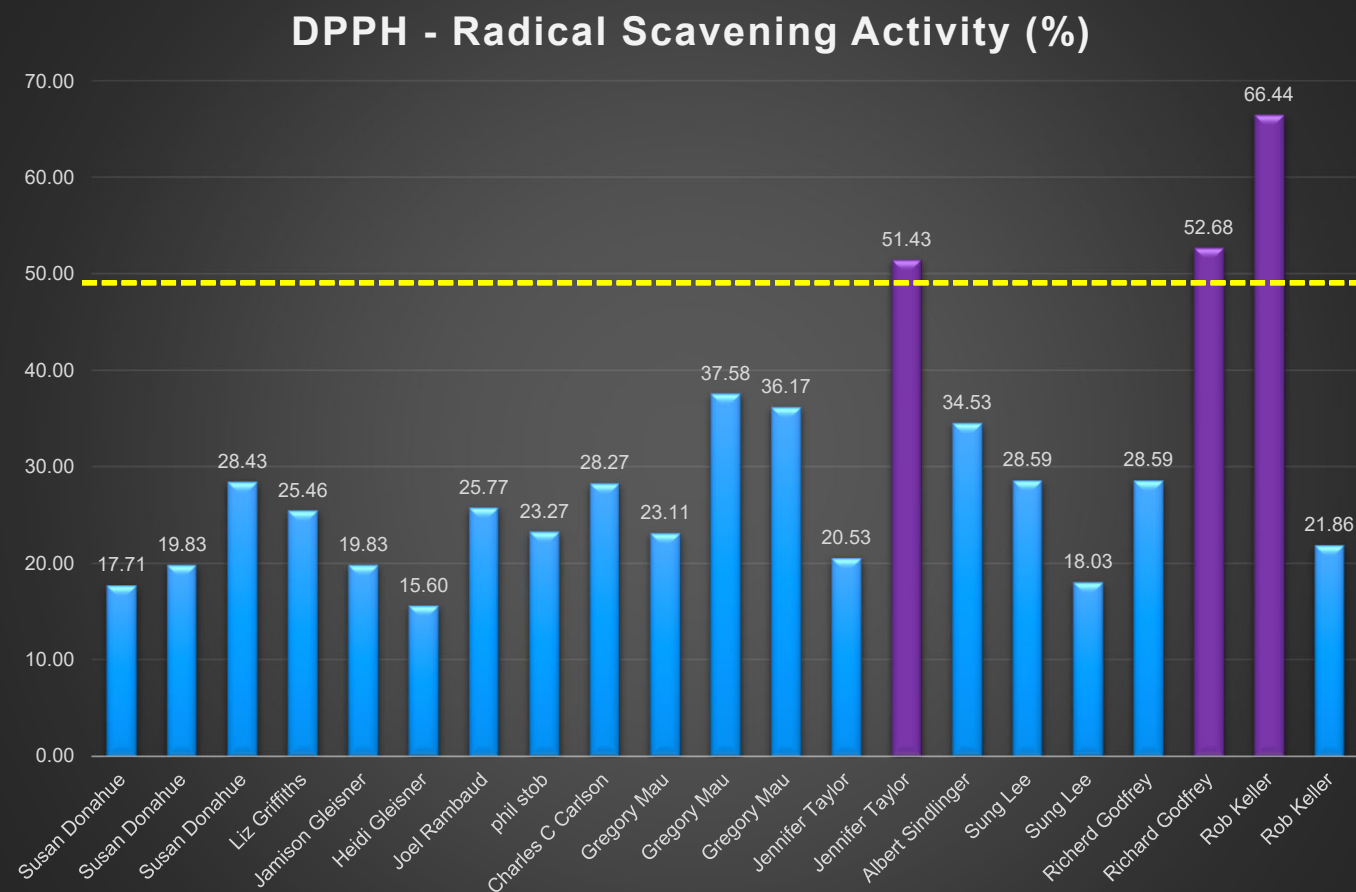


Antioxidant Activity of CA Honey Samples- 2025

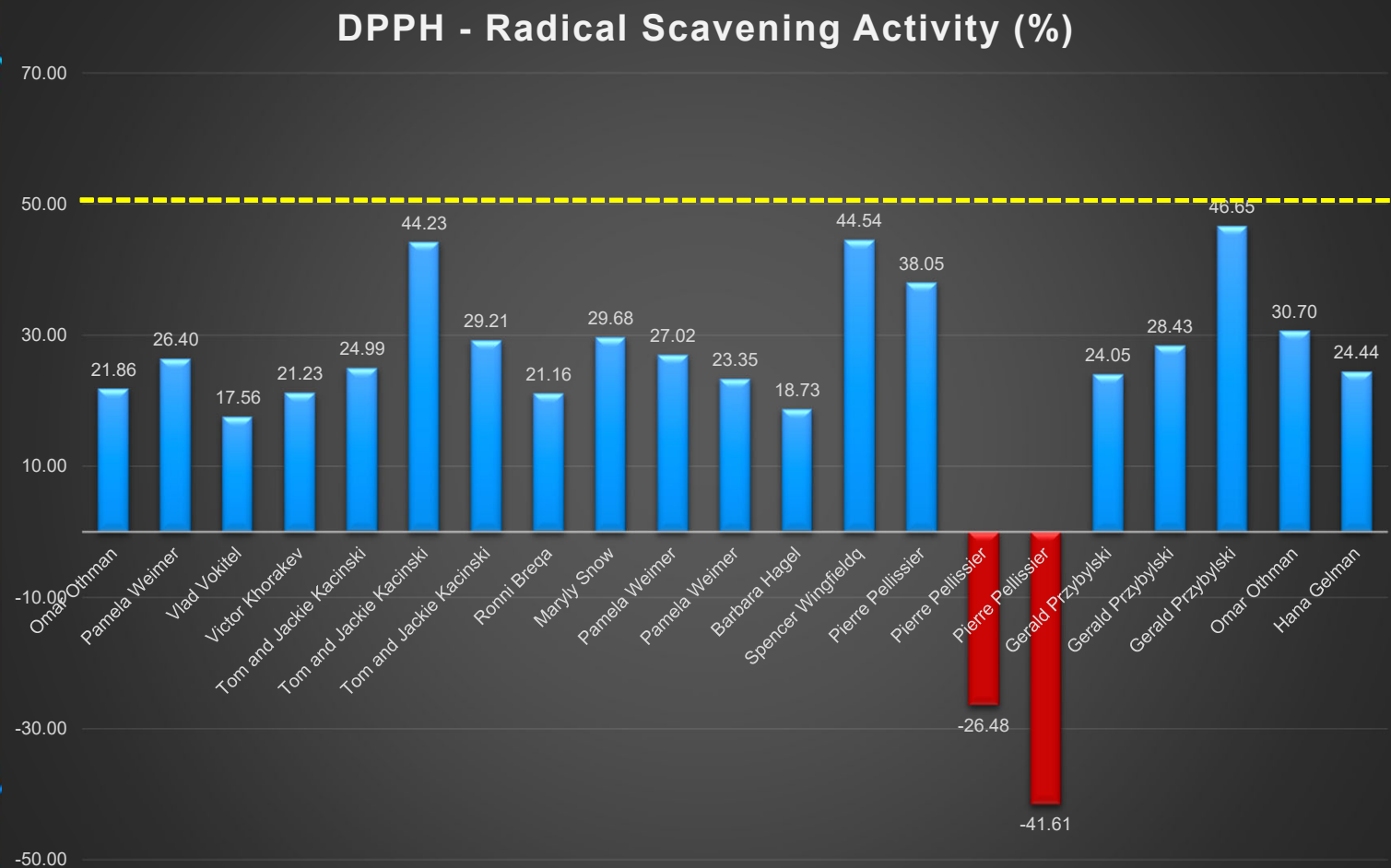
DPPH - Radical Scavening Activity (%)



Antioxidant Activity of CA Honey Samples- 2025



Antioxidant Activity of CA Honey Samples- 2025



Conclusions

Northern California Honeys

- ❖ **Color:** Light and Extra Light Amber
- ❖ **pH:** Low (3.7) – **Moisture:** Normal (17.1%)
- ❖ **Antimicrobial Activity:** High (68%)
- ❖ **Antioxidant Activity:** Low (4%)
- ❖ **Medical-Grade Honey Classification:**
Antimicrobial Activity (similar to Manuka)

Thank
You
Questions?

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Access HONEY Pathway



HoneyPathway@UTSA.edu