Developing Novel Packaging and Processing Systems to Improve Pecan Quality and Marketability

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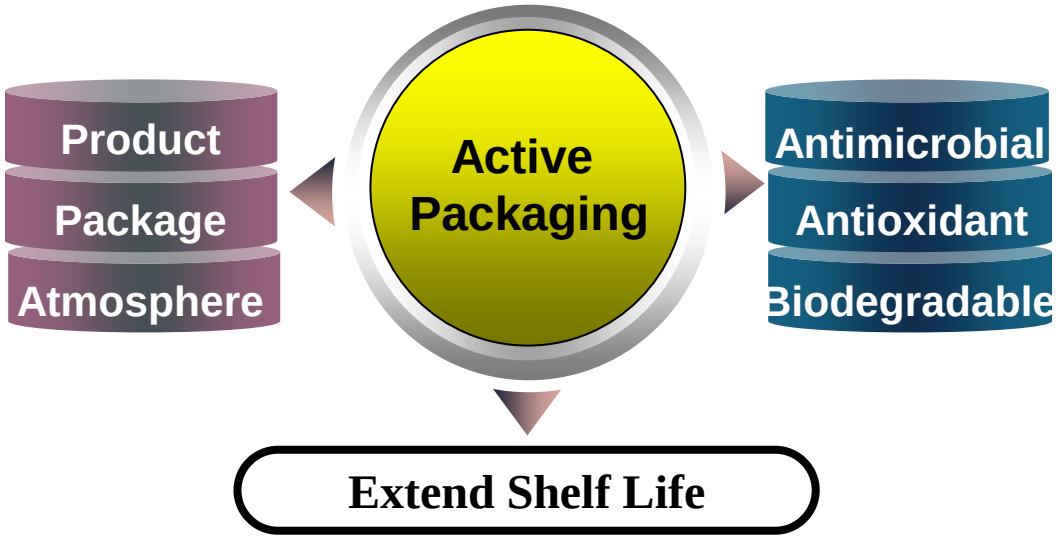
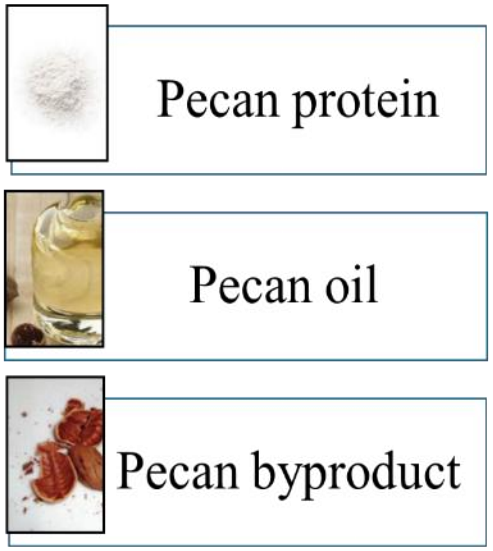
Research Areas

- **Postharvest Preservation**



- **New Product Development**



Edible Coating

- One of the most cost-effective ways to maintain food quality and safety

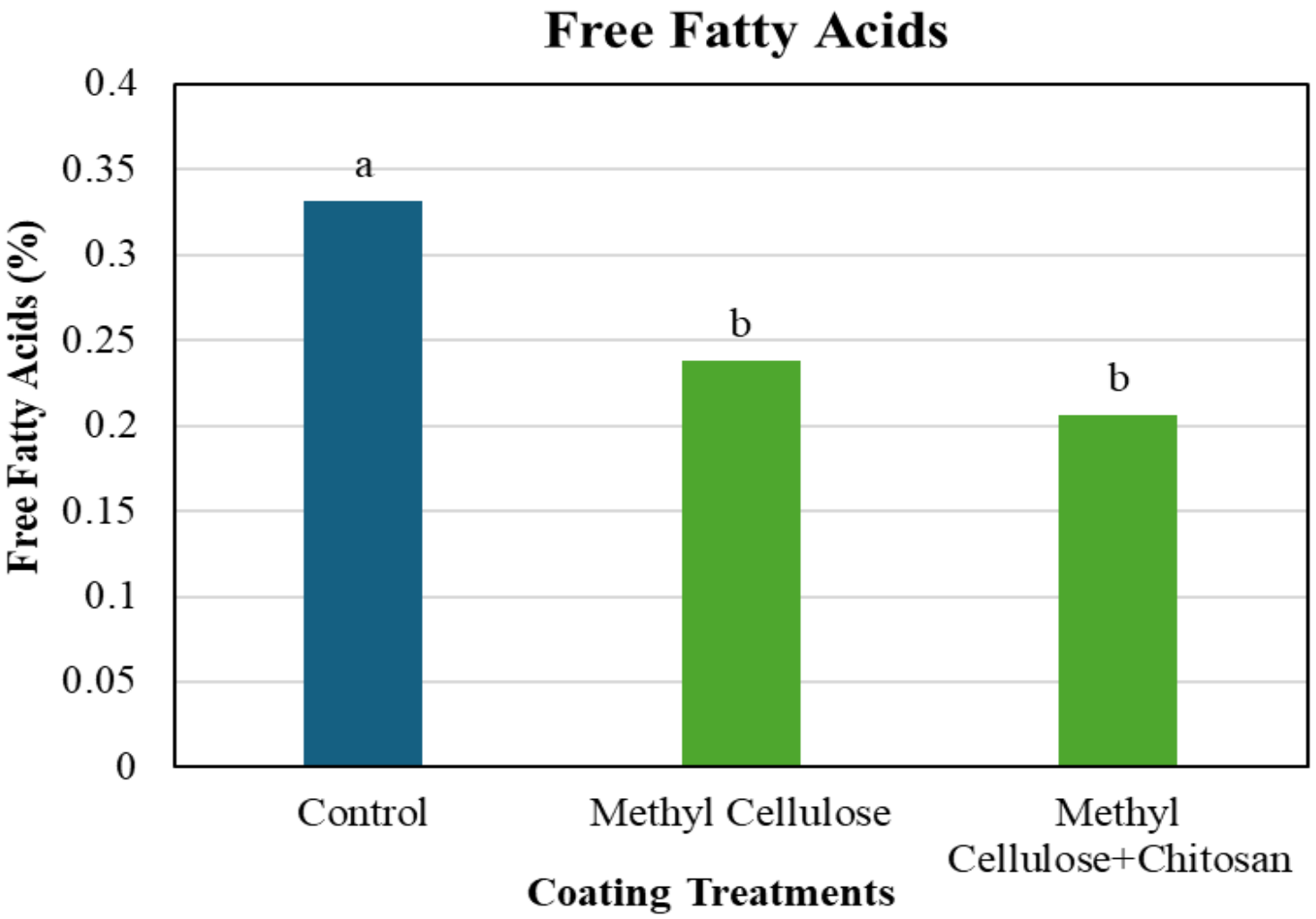
- Form an enhanced protection layer on food surfaces

Control

Methyl Cellulose (MC)

MC + Chitosan

Edible Coating for Pecan Quality



Coatings reduced the oxidation rate of pecan

Edible Coating for Pecan Quality and Safety

Control

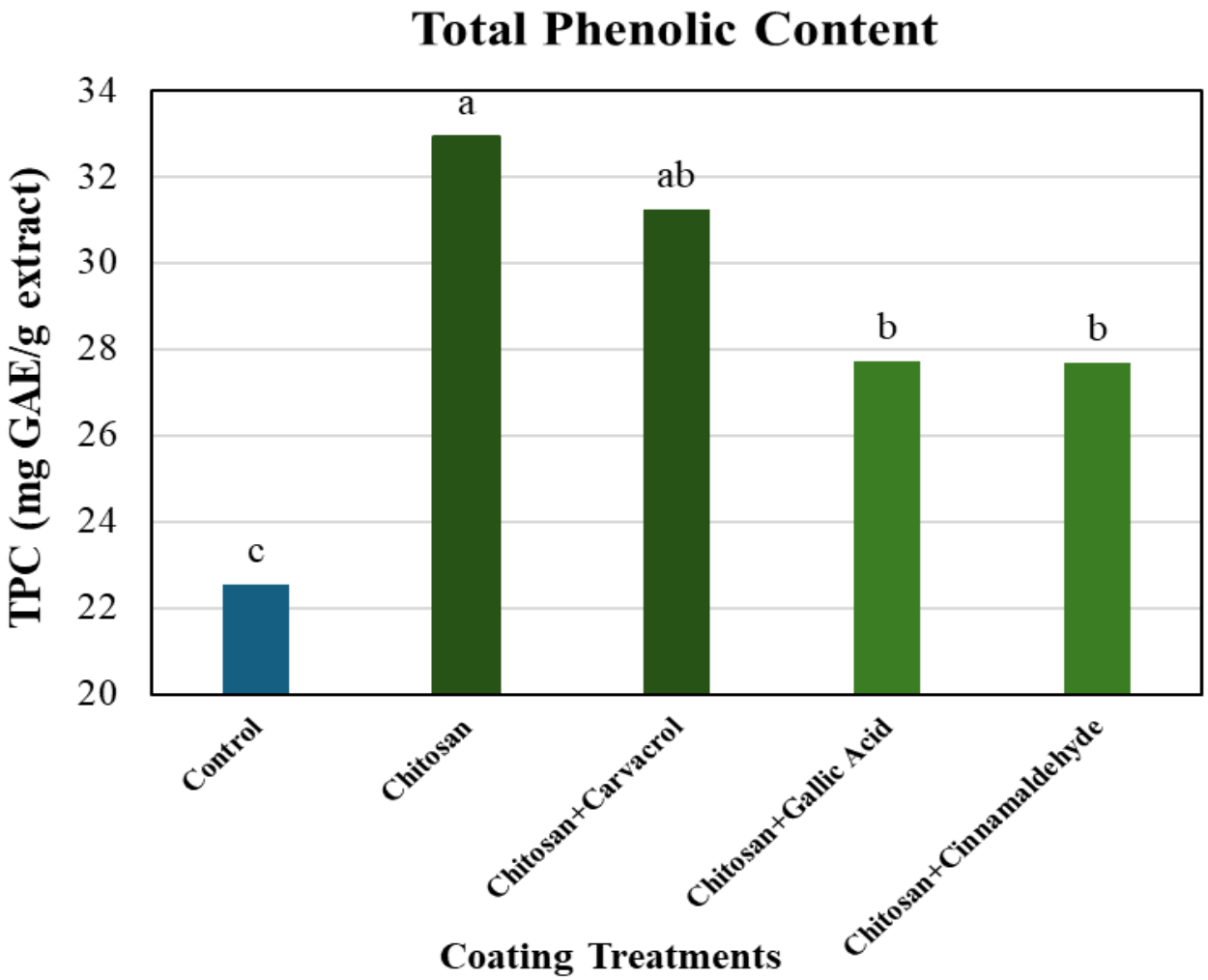
Chitosan

Chitosan+
Carvacrol

Chitosan+
Gallic acid

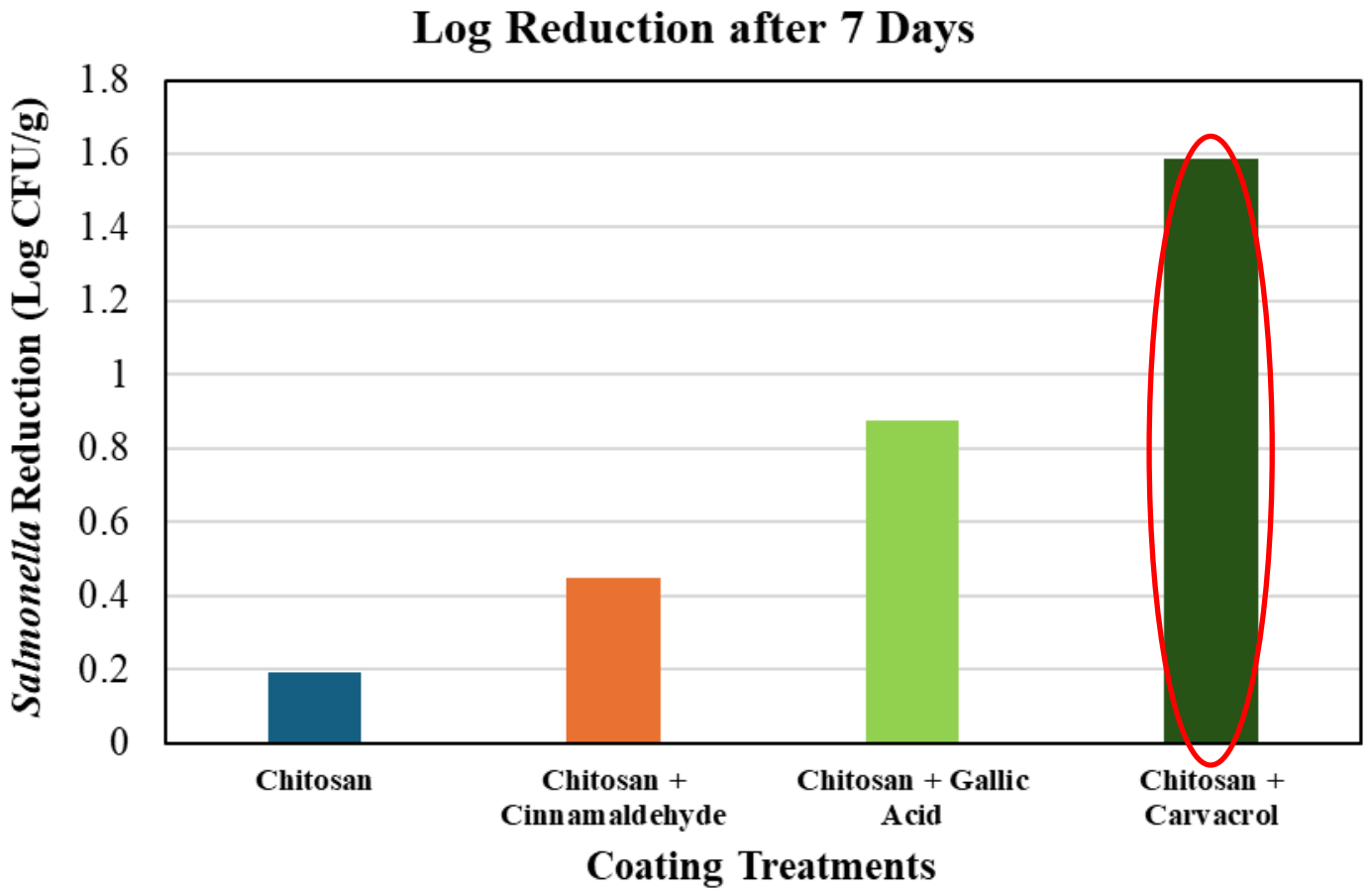
Chitosan+
Cinnamaldehyde

Edible Coatings for Pecan Quality



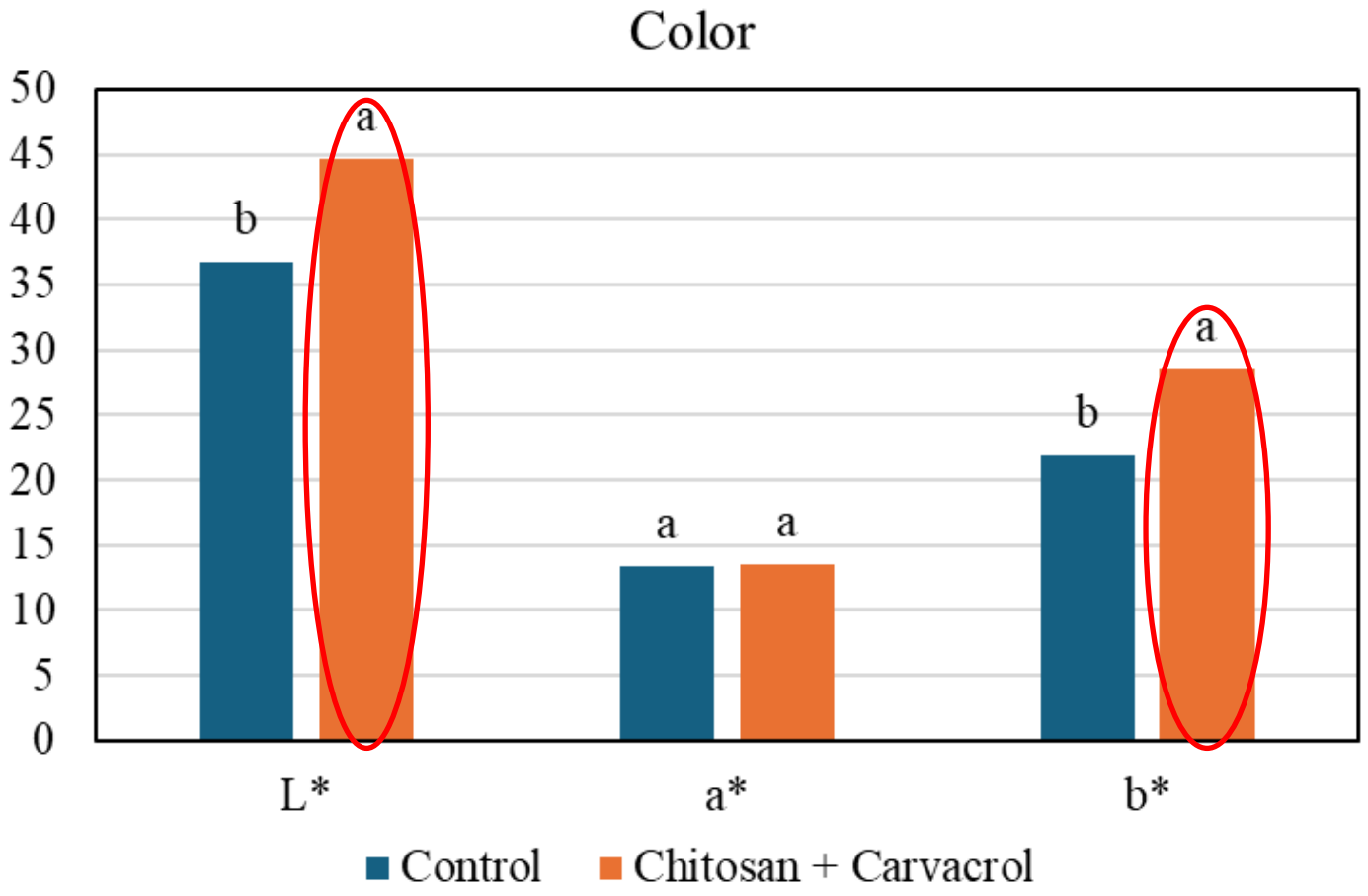
Coated nuts have better quality with better antioxidant properties and health benefits

Edible Coatings for Pecan Safety



Chitosan+carvacrol coating showed the strongest antimicrobial activity against *Salmonella*

Edible Coating for Pecan Color



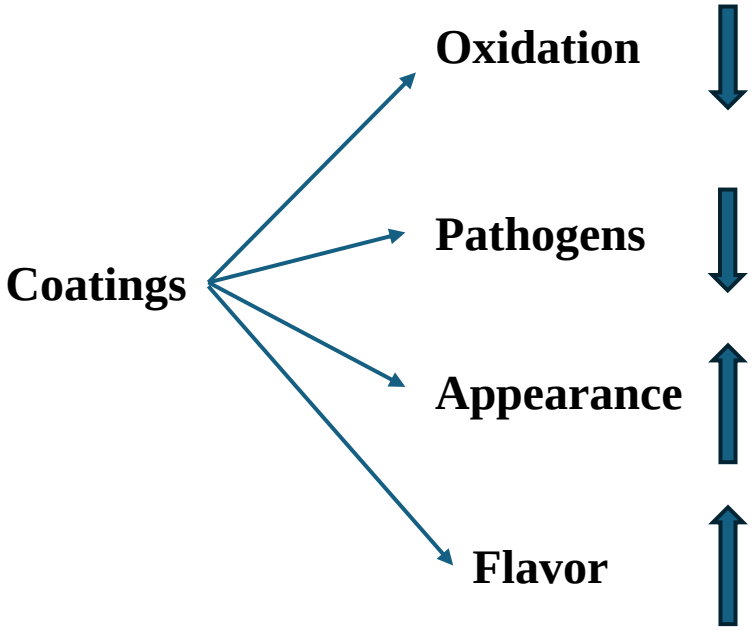
Chitosan coating with carvacrol treated nuts were brighter and yellower

Edible Coating for Inshell Pecan Preservation

Control **C1** **C2** **C3** **C4** **C5** **C6**

Fatty acid ***Carnauba*** ***Shellac***

Edible Coating for Pecan Preservation



Coating as carrier for active compounds, nutrients, or seasonings

Other Postharvest Preservation Methods

Biodegradable film

Hypobaric chamber

1-MCP

Vacuum packaging

New Pecan Product Development

Pecan oil

Pecan protein

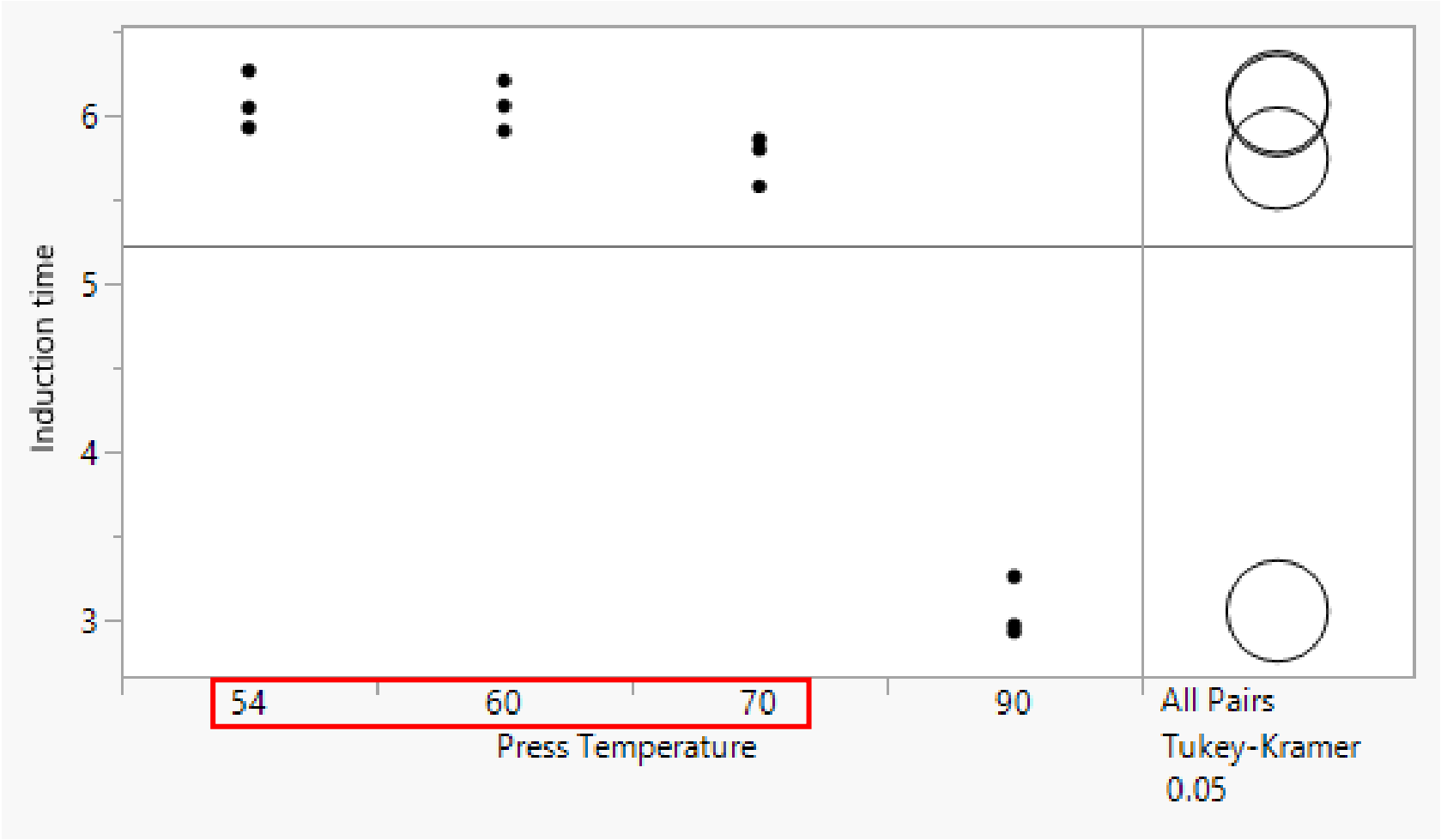
Pecan byproduct

New Pecan Product Development

Pressing Temperature (°C)	Yield (%)	Free Fatty Acid (%)	Total Phenolic Content (mg GAE/g extract)
54	38 ± 14 b	0.26 ± 0.02 d	28.69 ± 1.95 a
70	**53 ± 11 a**	**0.49 ± 0.01 c**	**32.27 ± 2.62 a**
90	61 ± 1 a	0.56 ± 0.02 b	30.67 ± 1.12 a
110	62 ± 1 a	0.65 ± 0.01 a	33.19 ± 2.36 a

Oil pressed at 70 °C had higher yield and better quality with lower free fatty acids

New Pecan Product Development



- **Oil pressed at 70 °C or lower was fresher**
- **Pressing temperature of 70 °C is ideal for both pecan oil quality and yield**

Acknowledgement

Lab member:

Samantha Sherman

Collaborators and stakeholders:

Dr. Cameron Bardsley, Kaicie Chasteen, Dr. Jinhe Bai, Dr. Kristen Jeffries, Nancy Owens, Dr. Jung Lee, Dr. Ajit Mahapatra, Dr. Rasika Dias

Sponsors:

RipeLocker PROLONGING FRESH

Verdant TECHNOLOGIES

USDA ARS

GEORGIA PECAN GROWERS Association

GEORGIA PECAN Commission

GEORGIA PECAN FARMS

Thank you!