

# BIOAPPLE



**A “Bio-apple” per Day  
Makes the Doctor go Away**

**Ass. Prof. Tsoupras Alexandros (PI)  
Hephaestus Laboratory, Department of Chemistry, School of Science  
Kavala University Campus, DUTH**



# BIOAPPLE



# ΘΕΚΛΑ

**Ass. Prof. Tsoupras Alexandros  
(PI)**

- Θερμοκοιτίδα στήριξης νεοφυών επιχειρηματικών ομάδων
- Δημοκρίτειο Πανεπιστήμιο Θράκης (ΔΠΘ), στην Πανεπιστημιούπολη Καβάλας
- Στόχοι: η ενδυνάμωση και ενίσχυση της δημιουργίας νεοφυών επιχειρήσεων μέσα από την στήριξη της καινοτόμου επιχειρηματικότητας, για την αναγέννηση της τοπικής (Περιφέρεια) και Εθνικής οικονομίας

- Αξιοποίηση Βιοδραστικών από Αγρο-διατροφικά Παραπροϊόντα
- Παραγωγή Καινοτόμων προϊόντων προστιθέμενης αξίας:
  - Βιο-λειτουργικά τρόφιμα
  - Συμπληρώματα διατροφής - nutraceuticals
  - Προϊόντα κοσμητικής
  - Φαρμακευτικά προϊόντα

# THE ROAD SO FAR

BSc – MSc – PhD  
Chemistry-Biochemistry  
NKUA (Greece)  
with Scholarships

Postdoctoral Research  
(Greece, US, Ireland)

Assistant Professor  
(Ireland & Greece)

2001 - Current  
Research on Inflammation  
& in Anti-inflammatory  
Health Promoting Properties  
of Natural Bioactives

2024

Apple products (apple juice and cider) and by-products (apple pomace):

Bioactive compounds and biological properties

Alexandros Tsoupras<sup>1,\*</sup>, Despina A. Gkika<sup>1</sup>, Theodoros Markopoulos<sup>1</sup>, Roisin Curran<sup>2</sup>, Ciara Scallan<sup>2</sup>, Maria Karali<sup>3</sup>, George Z. Kyzas<sup>1†</sup>

2023

Functional Foods and  
Their Implications for  
Health Promotion



Edited by  
Alexandra Zdzienicka  
Alexandros Tsoupras  
Hanan Leshem  
Olga Kozlova



Almost 100 Publications

More than 2500 Citations

(h-index = 26)

Several Books – Chapter

Patents - Inventions



antioxidants

2024



Article

Enrichment of whole-grain breads with food-grade extracted apple pomace bioactives enhanced their anti-inflammatory, antithrombotic and anti-oxidant functional properties

Alexandros Tsoupras<sup>1,\*</sup>, Donal Moran<sup>2</sup>, Katie Shiels<sup>3</sup>, Sushanta Kumar Saha<sup>3</sup>, Ibrahim M. Abu-Reidah<sup>4</sup>, Raymond Thomas<sup>5</sup>, Shane Redfern<sup>3†</sup>

# THE ROAD SO FAR

## Η ΟΜΑΔΑ ΜΑΣ

- **CEO:** *Ass. Prof. Alexandros Tsoupras*  
*Hephaestus Laboratory, Department of Chemistry*  
*School of Science, Kavala University Campus, DUTH*
- **Research & Innovation development:**  
*Dr Koumentakou Ioanna*  
*Dr Panagopoulou Eirini*  
*Dr Ofrydopoulou Anna*  
*Ms Vandorou Maria, Ms Seferli Marina, Ms Anita Marra, etc.*
- **Financial Manager:** *Dr Despina Gkika, Mr Karachalios Kostas (MSc)*
- **Manager of Production - Quality Control:** *Mrs. Maria Karali (MSc)*
- **Sales Manager:** *Mrs. Ioanna Tsoupra (MSc)*



# BIOAPPLE

# PROBLEM - OPPORTUNITY

- INCREASED DEMAND FOR HEALTHY FOODS BASED ON FRUITS AND VEGETABLES
- LARGE AMOUNT OF BIOWASTES THAT INCREASE THE AGRO-FOOD ECOLOGICAL FOOTPRINT AND COSTS FOR WASTE MANAGEMENT COST
- WHAT ABOUT APPLE BY-PRODUCTS (IN GREECE) ????

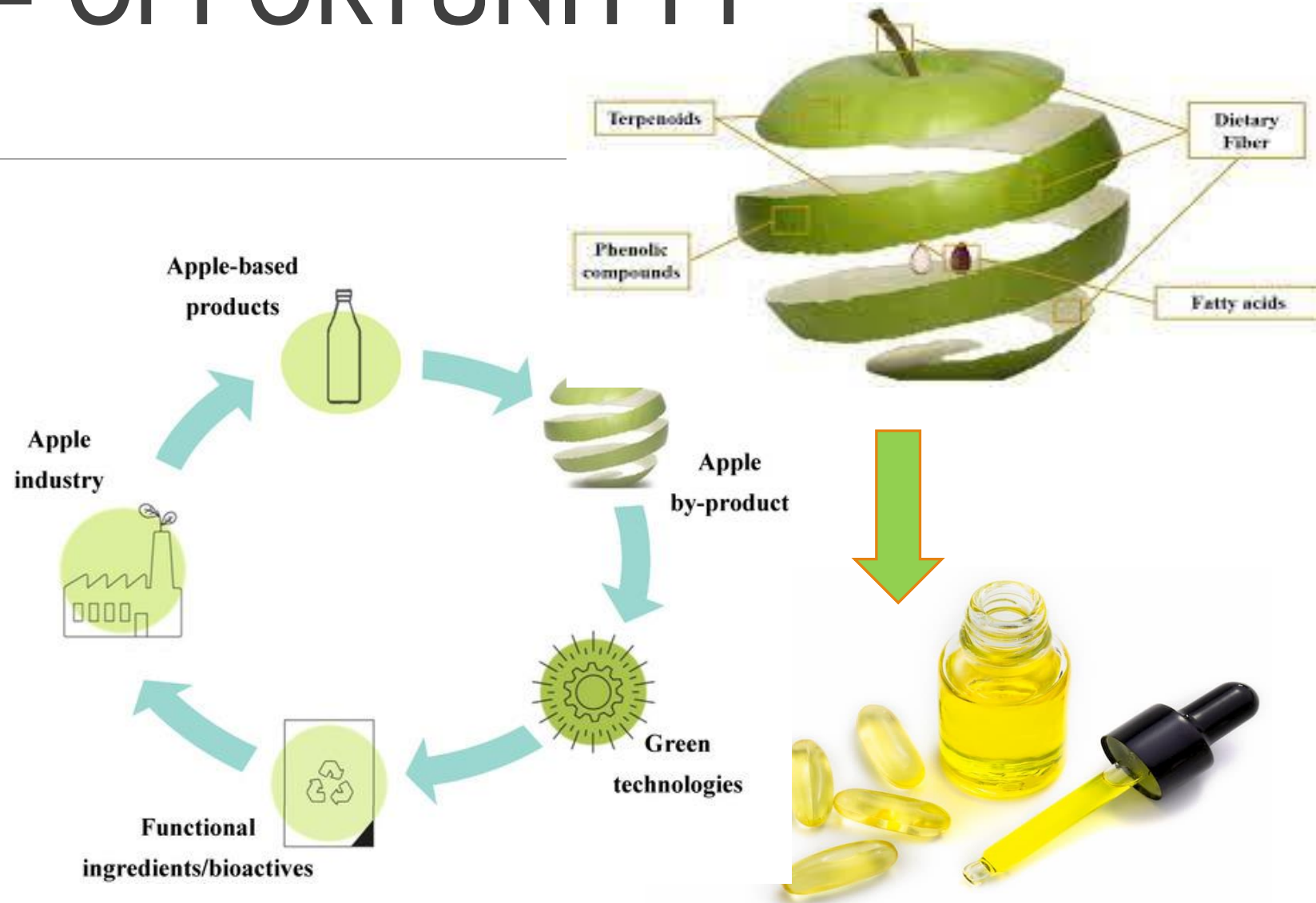


INCREASED  
BIO-WASTES

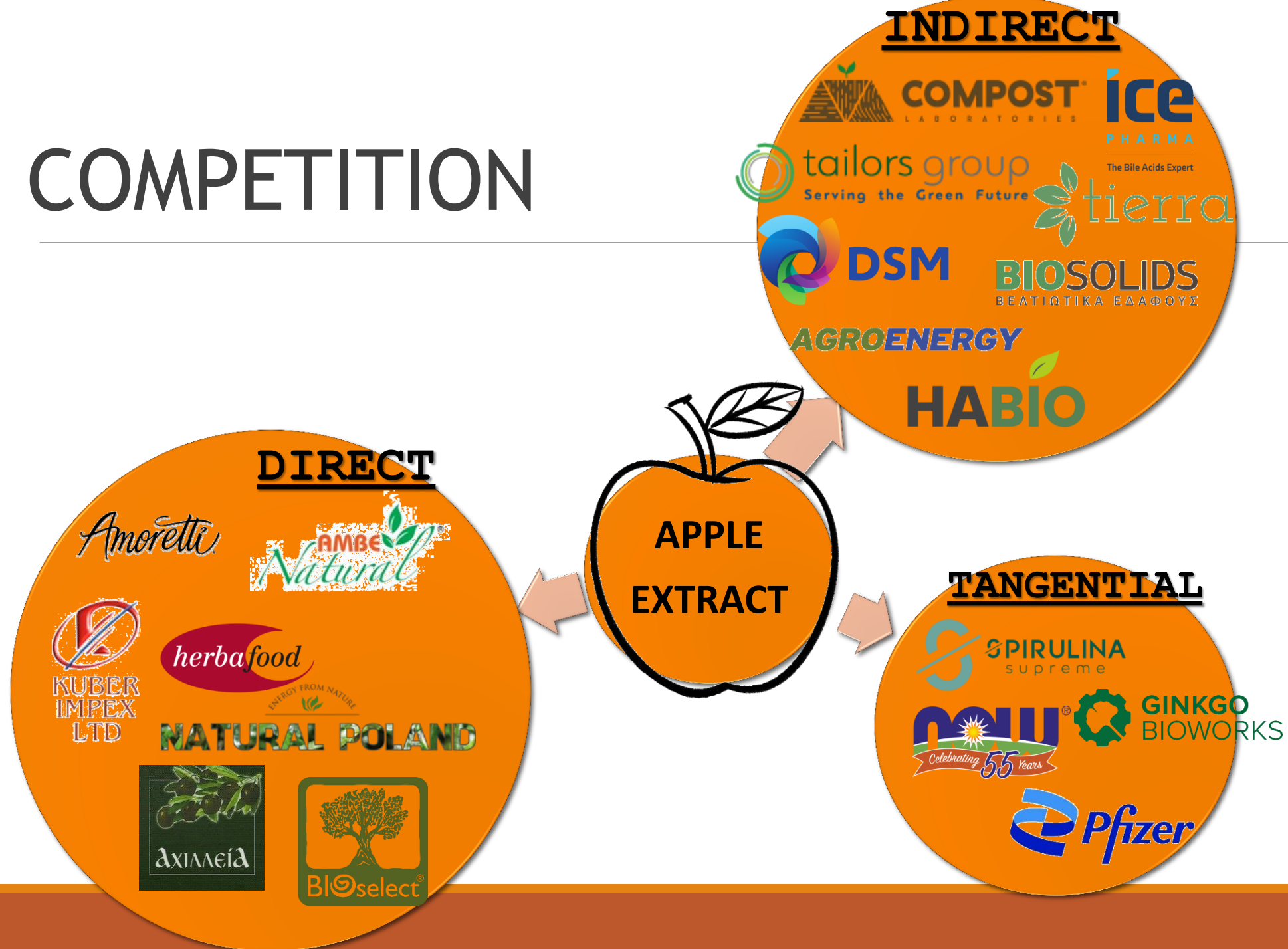


# THE SOLUTION = OPPORTUNITY

- Innovative environmental friendly Recovery of extracts rich in bioactives from apple pomace bio-wastes
- Several Applications in products (i.e. functional foods, supplements, drugs, cosmetics, etc.....) with Health Promoting Effects
- THE SKY IS HUGE



# COMPETITION



Abroad



NATURAL POLAND



Products based  
in other natural  
extracts



Greece

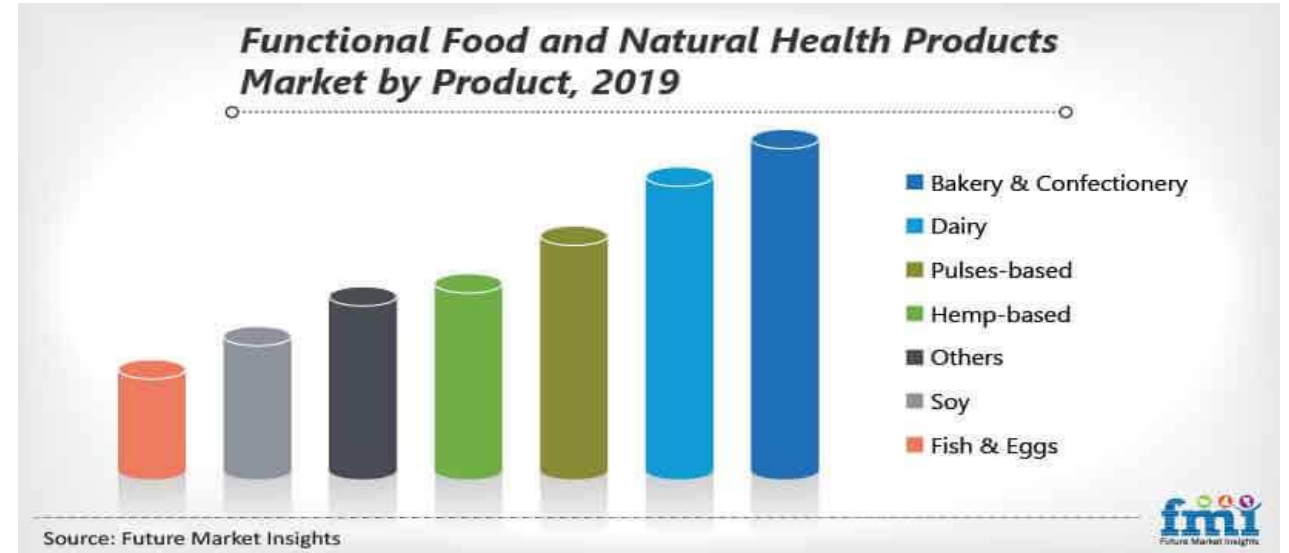
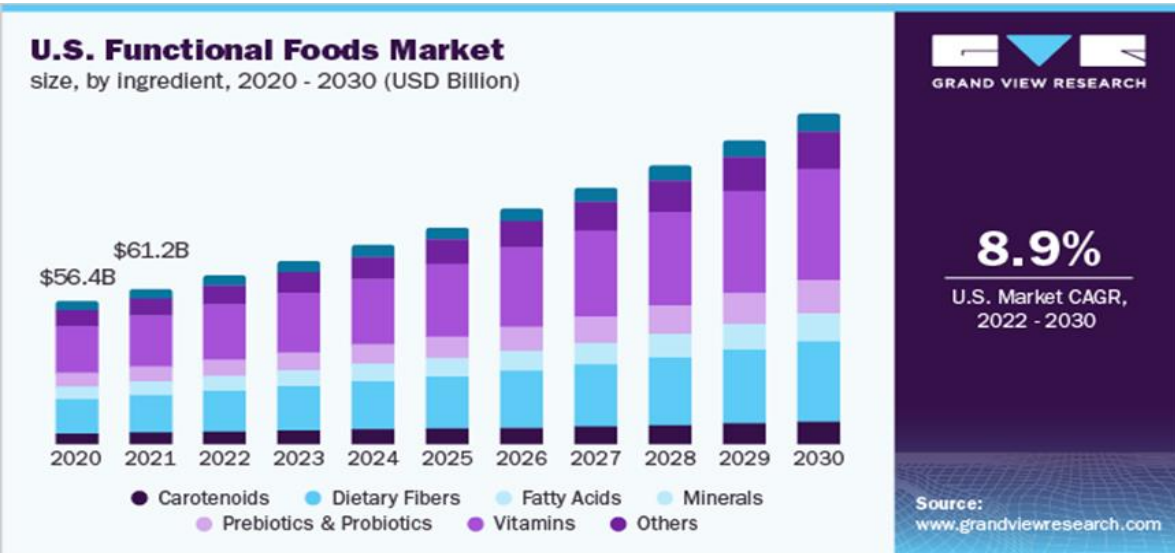


BIOAPPLE

Apple based  
extracts-products

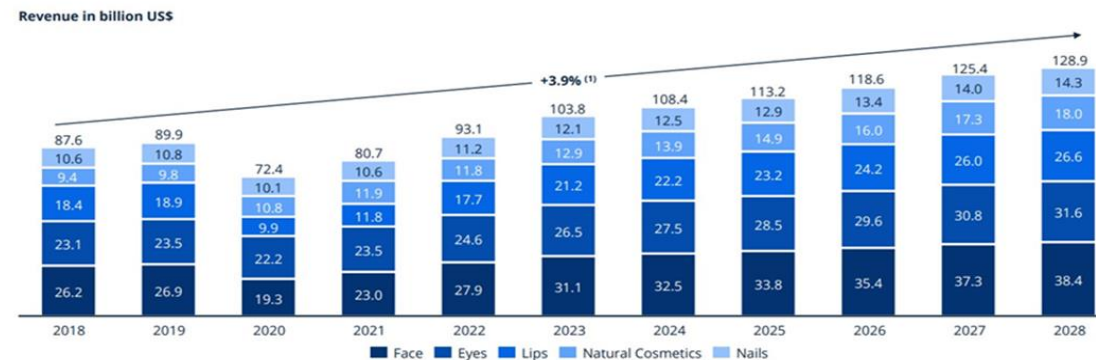


# MARKET



Cosmetics revenues are estimated to increase at a CAGR<sup>(1)</sup> of 3.9% from 2018 to 2028

Market Size: Global



# BUSINESS PLAN

## APPLE POMACE



## SUPPLIERS



## MOBILE UNITS



Industrial Extractor



Industrial Evaporator



Industrial Dryer

**MAIN PRODUCT**  
**EXTRACT RICH IN**  
**APPLE POMACE**  
**BIOACTIVES**

**Fertilizers**

**Functional Foods**

**Supplements**  
**Nutraceuticals**  
**Drugs**  
**Cosmetics**



# RESEARCH & DEVELOPMENT Valorization of Wineries' & Breweries' By-products



AIMS Agriculture and Food, 9(2): 568–606.  
DOI: 10.3934/agrfood.2024032  
Received: 29 February 2024  
Revised: 14 April 2024  
Accepted: 22 April 2024  
Published: 16 May 2024

<https://www.aimspress.com/journal/agriculture>

*Review*  
Anti-inflammatory, antithrombotic and anti-oxidant bioactives of beer and brewery by-products, as ingredients of bio-functional foods, nutraceuticals, cosmetics, cosmeceuticals and pharmaceuticals with health promoting properties

Alexandros Tsoupras<sup>1,\*</sup>, Eirini A. Panagopoulou<sup>2</sup> and George Z. Kyzas<sup>1</sup>



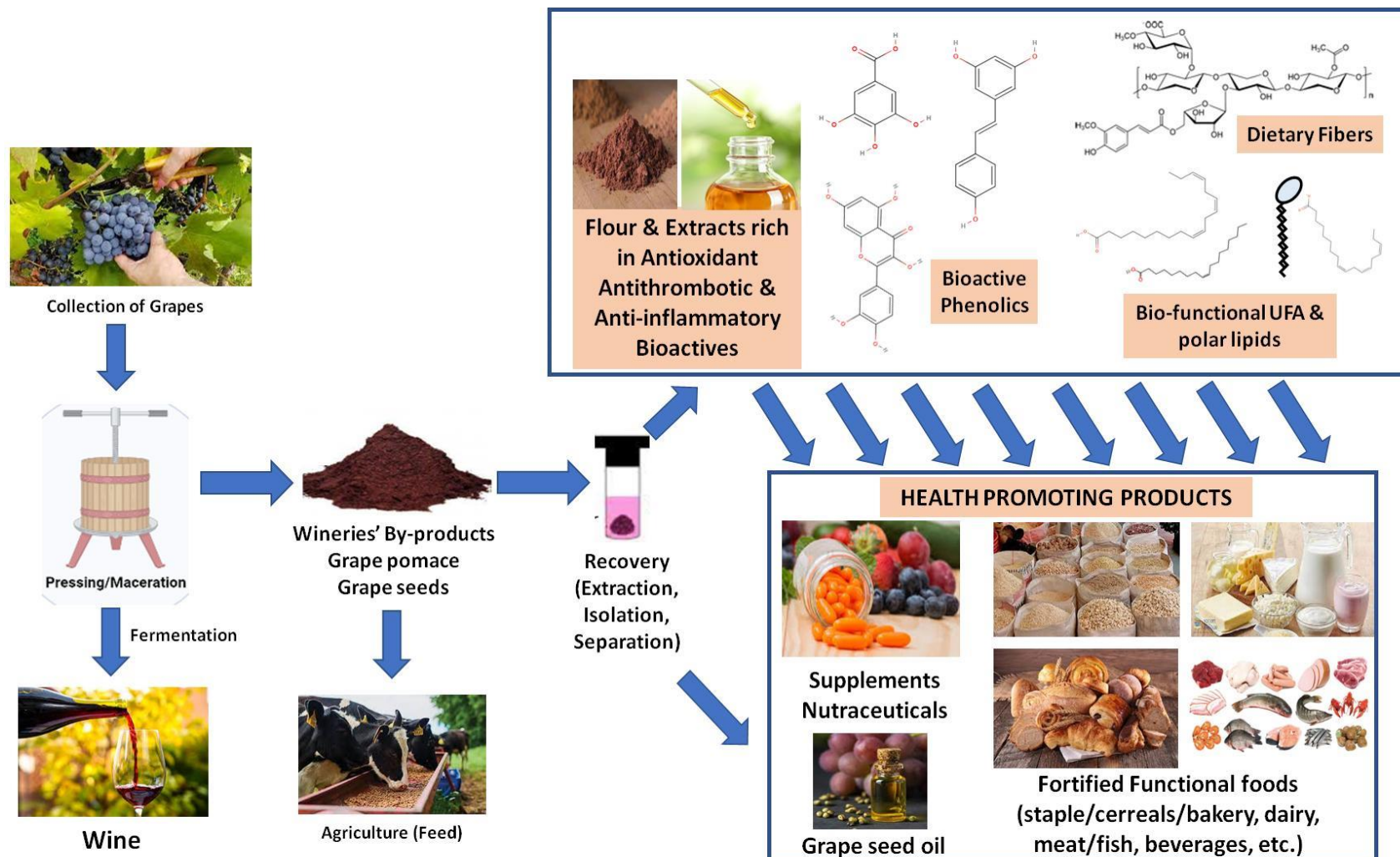
fermentation



*Review*

## Winemaking: “With One Stone, Two Birds”? A Holistic Review of the Bio-Functional Compounds, Applications and Health Benefits of Wine and Wineries' By-Products

Alexandros Tsoupras<sup>1,\*</sup>, Victoria Ling Jun Ni<sup>2</sup>, Éimhín O'Mahony<sup>2</sup> and Maria Karali<sup>3</sup>



# RESEARCH & DEVELOPMENT

## Valorization of other Agri-Food By-products

Review

### Anti-inflammatory benefits of grape and tomato bioactives as ingredients in sun-oils against UV radiation for skin protection

Nefeli Kontaxi<sup>1</sup>, Alexandros Tsoupras<sup>1,\*</sup>



<sup>1</sup>→ Hephaestus Laboratory, Department of Chemistry, International Hellenic University, Kavala University Campus, GR65404, Kavala, Greece; [Nefelikontaxi4@gmail.com](mailto:Nefelikontaxi4@gmail.com); [atsoupras@chem.ihu.gr](mailto:atsoupras@chem.ihu.gr)

\*→ Correspondence: [atsoupras@chem.ihu.gr](mailto:atsoupras@chem.ihu.gr); [atsoupras@gmail.com](mailto:atsoupras@gmail.com)

Featured Application: Valorization of grape and tomato-derived extracts and/or bioactives, with anti-inflammatory and antioxidant properties, as bio-functional ingredients of anti-UV sun-oils for skin protection

Review

### Anti-inflammatory and antioxidant bioactives of avocado and its by-products as ingredients for functional foods and cosmetics with health promoting properties

Anita Marra<sup>1</sup>, Vasileios Manousakis<sup>1</sup>, Georgios Panagiotis Zervas<sup>1</sup>, Nikolaos Koutis<sup>1</sup>, Alexandros Tsoupras<sup>1,\*</sup>



<sup>1</sup>→ Hephaestus Laboratory, Department of Chemistry, International Hellenic University, Kavala University Campus, GR65404, Kavala, Greece; [anmarra@chem.ihu.gr](mailto:anmarra@chem.ihu.gr); [manousakisvasilis12@gmail.com](mailto:manousakisvasilis12@gmail.com); [geper-va@chem.ihu.gr](mailto:geper-va@chem.ihu.gr); [nikoskoutis2003@gmail.com](mailto:nikoskoutis2003@gmail.com); [atsoupras@chem.ihu.gr](mailto:atsoupras@chem.ihu.gr)

\*→ Correspondence: [atsoupras@chem.ihu.gr](mailto:atsoupras@chem.ihu.gr); [atsoupras@gmail.com](mailto:atsoupras@gmail.com)

Featured Application: Valorization of bioactives from avocado and its by-products as ingredients of functional foods and cosmetics applications with health promoting properties

Review

### Bioactives of kiwi with antioxidant and anti-inflammatory properties for functional foods and cosmetics applications with health benefits

Anastasia Maria Moysidou<sup>1</sup>, Konstantina Cheibeloglou<sup>1</sup>, Spyridoula Ioanna Koutra<sup>1</sup>, Alexandros Tsoupras<sup>1,\*</sup>

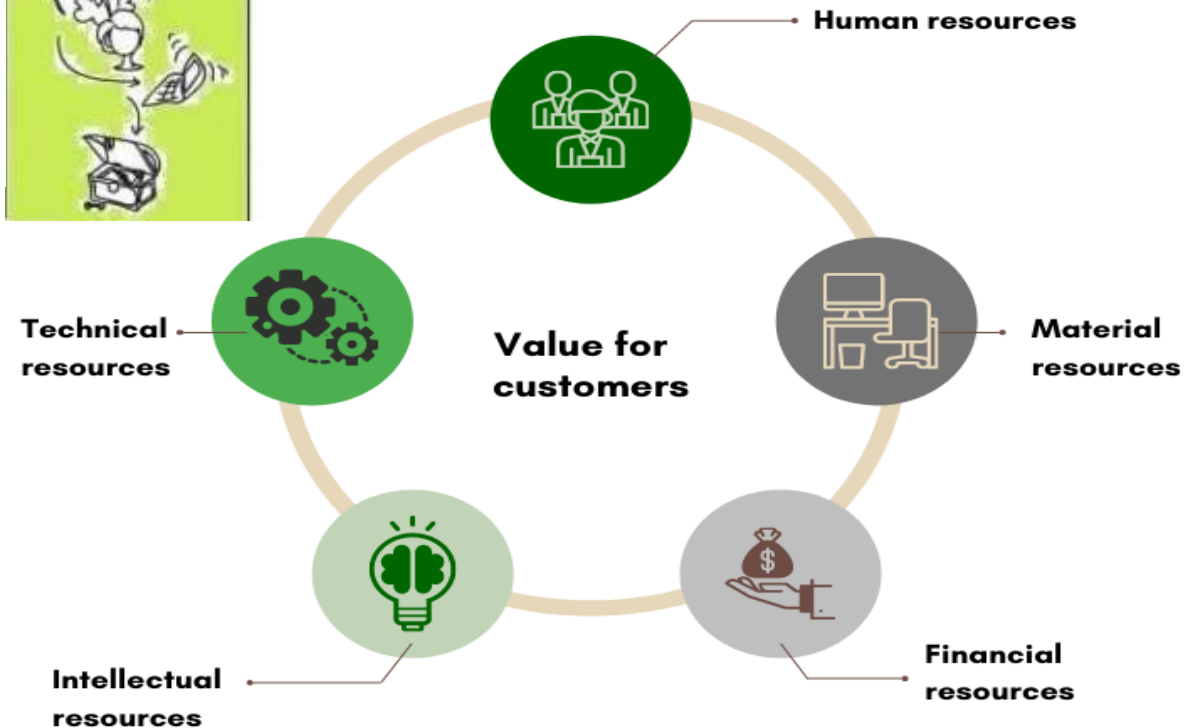
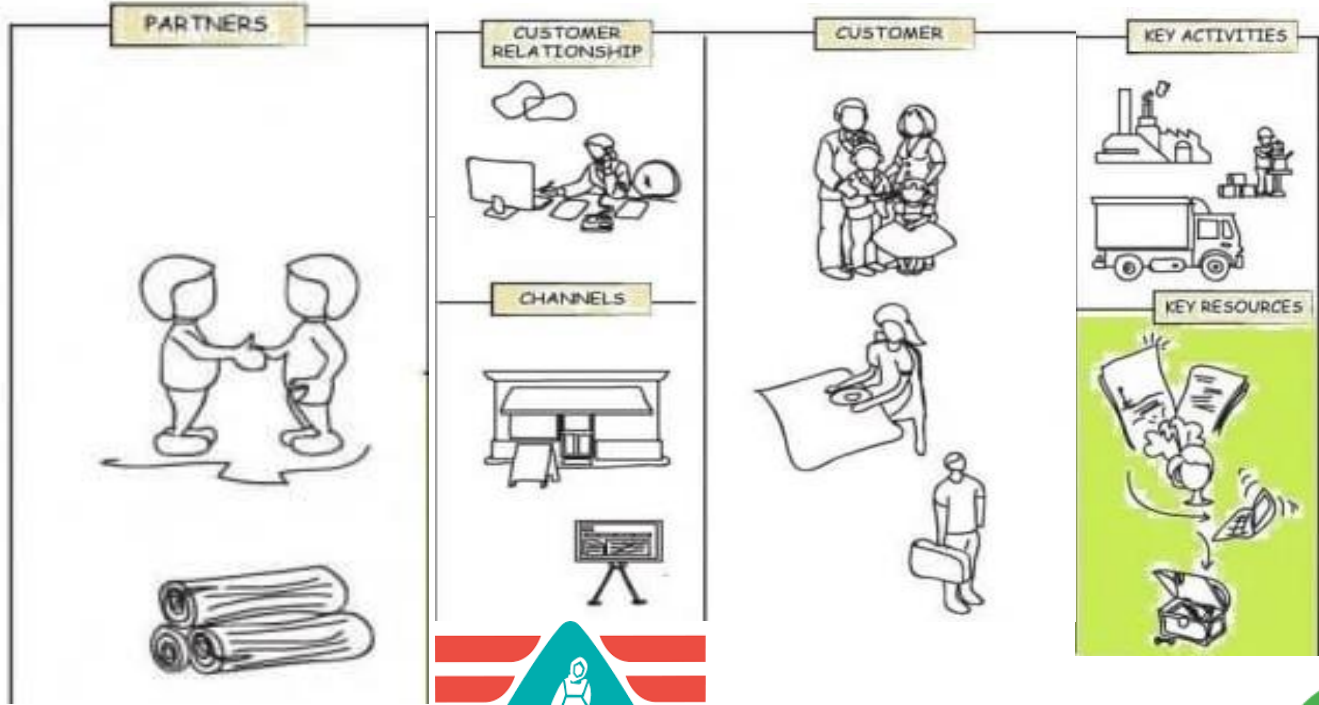


<sup>1</sup>→ Hephaestus Laboratory, Department of Chemistry, International Hellenic University, Kavala University Campus, GR65404, Kavala, Greece; [anmovsi@chem.ihu.gr](mailto:anmovsi@chem.ihu.gr); [kocheib@chem.ihu.gr](mailto:kocheib@chem.ihu.gr); [spyridoulakoutra17@gmail.com](mailto:spyridoulakoutra17@gmail.com); [atsoupras@chem.ihu.gr](mailto:atsoupras@chem.ihu.gr)

\*→ Correspondence: [atsoupras@chem.ihu.gr](mailto:atsoupras@chem.ihu.gr); [atsoupras@gmail.com](mailto:atsoupras@gmail.com)

Featured Application: Valorization of kiwi and kiwi by-products' bioactives as ingredients in functional foods' and cosmetics' applications with anti-inflammatory and antioxidant health benefits

# THE ROAD AHEAD



**KORRES**



# FINANCIAL PLAN

|                                                    | Year 1         | Year 2         | Year 3         |
|----------------------------------------------------|----------------|----------------|----------------|
| <b>Total Sales</b>                                 | € 5.000.000,00 | € 5.000.000,00 | € 5.000.000,00 |
| <b>Cost of Goods Sold (COGS)</b>                   | € 500.000,00   | € 1.000.000,00 | € 500.000,00   |
| <b>Gross Profit (Total Sales-COGS)</b>             | € 4.500.000,00 | € 4.000.000,00 | € 4.500.000,00 |
| <b>Operational Expenses</b>                        | € 1.500.000,00 | € 3.000.000,00 | € 1.500.000,00 |
| <b>EBIT (Earnings Before Interest &amp; Taxes)</b> | € 3.000.000,00 | € 1.000.000,00 | € 3.000.000,00 |

# THE ROAD AHEAD

## Trust Your Stars

**Project 1**  
**(Υπό Κατάθεση Πρόταση:**  
**BioWINE)**

**Project 2**  
**(Υπό Κατάθεση Πρόταση:**  
**CardioBENTHOL)**

## ΕΛΙΔΕΚ

**ΕΛΙΔΕΚ 1**  
**(Κατατεθειμένη Πρόταση:**  
**BioASPIS)**

**ΕΛΙΔΕΚ 2**  
**(Υπό Κατάθεση Πρόταση:**  
**ThrOLIBy)**

**ΕΛΙΔΕΚ 3**  
**(Υπό Κατάθεση Πρόταση:**  
**GraPOMACE)**

## Ερευνώ - Καινοτομώ

**Project 1**  
**(Υπό Κατάθεση Πρόταση:**  
**DeAlcoWINE)**

**Project 2**  
**(Υπό Κατάθεση Πρόταση:**  
**ThassOlivA)**

**Project 3**  
**(Υπό Κατάθεση Πρόταση:**  
**BioPomegrana)**

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30/5/2024