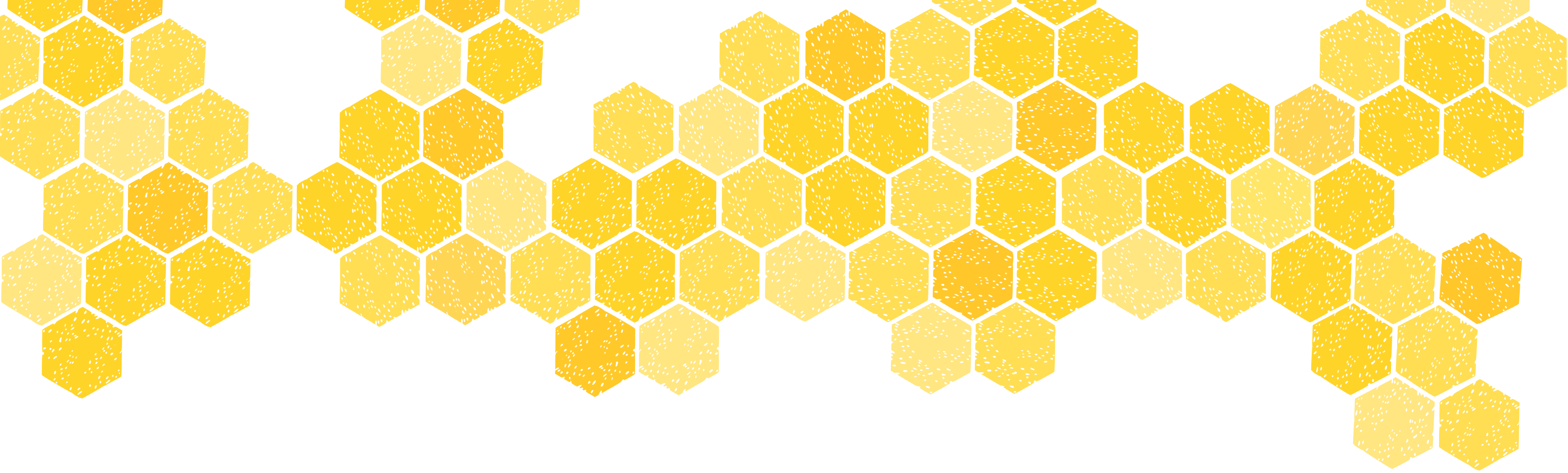
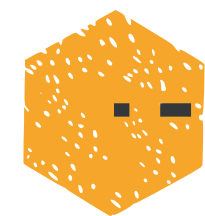


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**bee-io**

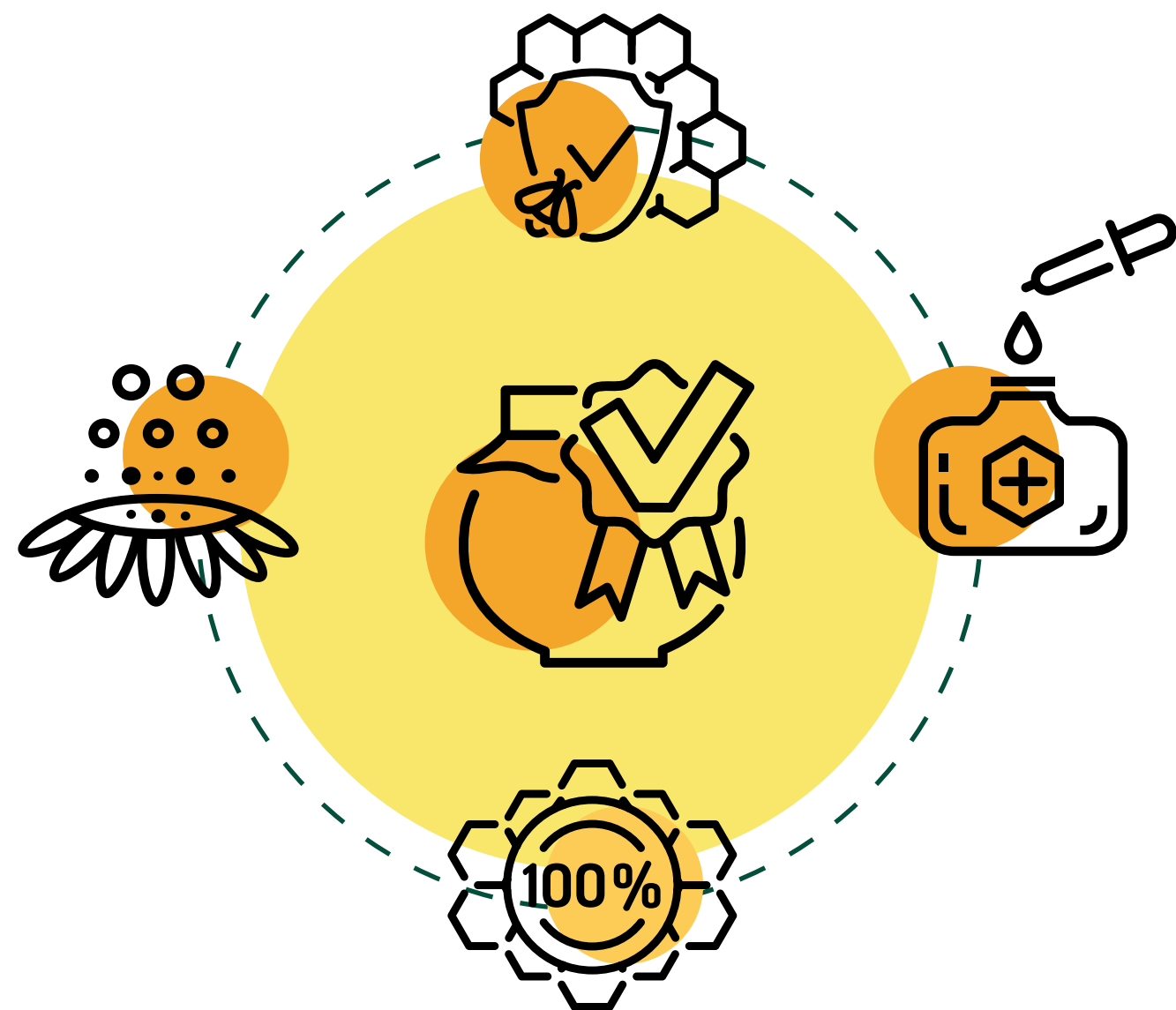
**Keep the world sweet**

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# INTRODUCTION



Bee-io produces honey without bees in a process that combines natural nectar flowers with unique biological processes that turn the nectar into honey.

The demand for honey continues to rise along with population growth. Honey is a miraculous product, the fruit of a unique interaction between the plant and animal kingdoms.

Bees are perfectly adapted to pollinate, helping plants grow, breed and produce food. They do so by transferring pollen between flowering plants and therefore keeping the cycle of life turning.

There is growing public and political concern at bee decline across the world that includes loss of habitat and food sources, exposure to pesticides, and the effects of climate breakdown.



# ABOUT US



# OUR TEAM



**OFIR DVASH**  
CEO

Ofir (B.Sc. in Engineering from the Ben Gurion University and M.Sc in Economics from the Hebrew University) has over 12 years of experience leading the development of military and commercial products, from initial concept to a complete and final product. In the past 5 years leading GKI Group's technological innovations while building and managing three start-up companies.



**DR. EFRAT DVASH**  
CTO

Dr. Efrat Dvash Riesenfeld earned her PhD In Molecular Genetics from the Weizmann Institute of Science (2015). Efrat was awarded an American Diabetes Association fellowship and conducted her postdoctoral research at Harvard Medical School (2018). In the past 2 years she was the Director of Breast Cancer Translational Research Laboratory at Tel Aviv Sourasky Medical Center (Ichilov Hospital).

## Company Information:



Offices and laboratory situated in Park Hamada, Rehovot, Israel



A team 20 employees  
13 R&D researchers  
8 Ph.D. in microbiology

# ADVISORY BOARD



**PROF. MENACHEM RUBINSTEIN**  
ADVISOR

Prof. Menachem Rubinstein is a member of the Department of Molecular Genetics at the Weizmann Institute of Science. During his career, Prof. Rubinstein's research focused on questions with bio-chemical and molecular aspects, while using cutting edge technological and scientific techniques. His studies led to the development of three drugs used for autoimmune diseases, viral infections and cancer. Prof. Rubinstein has vast experience in protein expression, isolation and characterization. Many of his discoveries led to registration of patented inventions.



**PROF. GUY BLOCH**  
ADVISOR

Professor Guy Bloch is one of the top research scientists from the Department of Ecology, Evolution, and Behavior (EEB) at The Hebrew University of Jerusalem. Professor Bloch's main research interests are the evolution and mechanisms underlying sociality and social behavior, using bees as a model system. Professor Guy Bloch has also years of experience working as a scientific advisor to Pollination Services Yad-Mordechai



**PROF. YUVAL SHOHAM**  
ADVISOR

Prof. Yuval Shoham from the Department of Biotechnology and Food Engineering at the Technion institute. Received his Ph.D. in Biochemical Engineering from M.I.T. Served as the director of The Lorry I. Lokey Interdisciplinary Center for Life Sciences and Engineering, and as the President of the Israel Society for Microbiology. Professor Shoham's research focuses on the catalytic mechanisms and structure-function relationships of industrial enzymes. He was involved in several industrial projects, including the development of a large-scale process for bleaching paper pulp and an enzymatic process for making low calorie natural juices.



# MARKET OPPORTUNITIES



# HONEY MARKET SIZE

- + The global honey market size was valued at USD 9.08 billion in 2019.
- + Honey market size is expected to reach a of 17.2 billion USD in 2028.
- + Expected compound annual growth rate (CAGR) of 8%.



## The factor driving the market growth includes:

- + High demand for nutritious food products (super food) such as honey, as part of maintaining a healthy lifestyle.
- + honey is becoming widely used in many applications: food & beverages, cosmetics and pharmaceuticals.
- + World population growth.

Source: The global honey market and Ukraine challenges and trends



# 2020 - HONEY WAS DECLARED THE MOST PREFERRED SWEETENER IN THE USA

Which of the following sweeteners is your favorite?  
(n= 2,000, Gen Pop)

Goodness Seekers  
(n= 350)

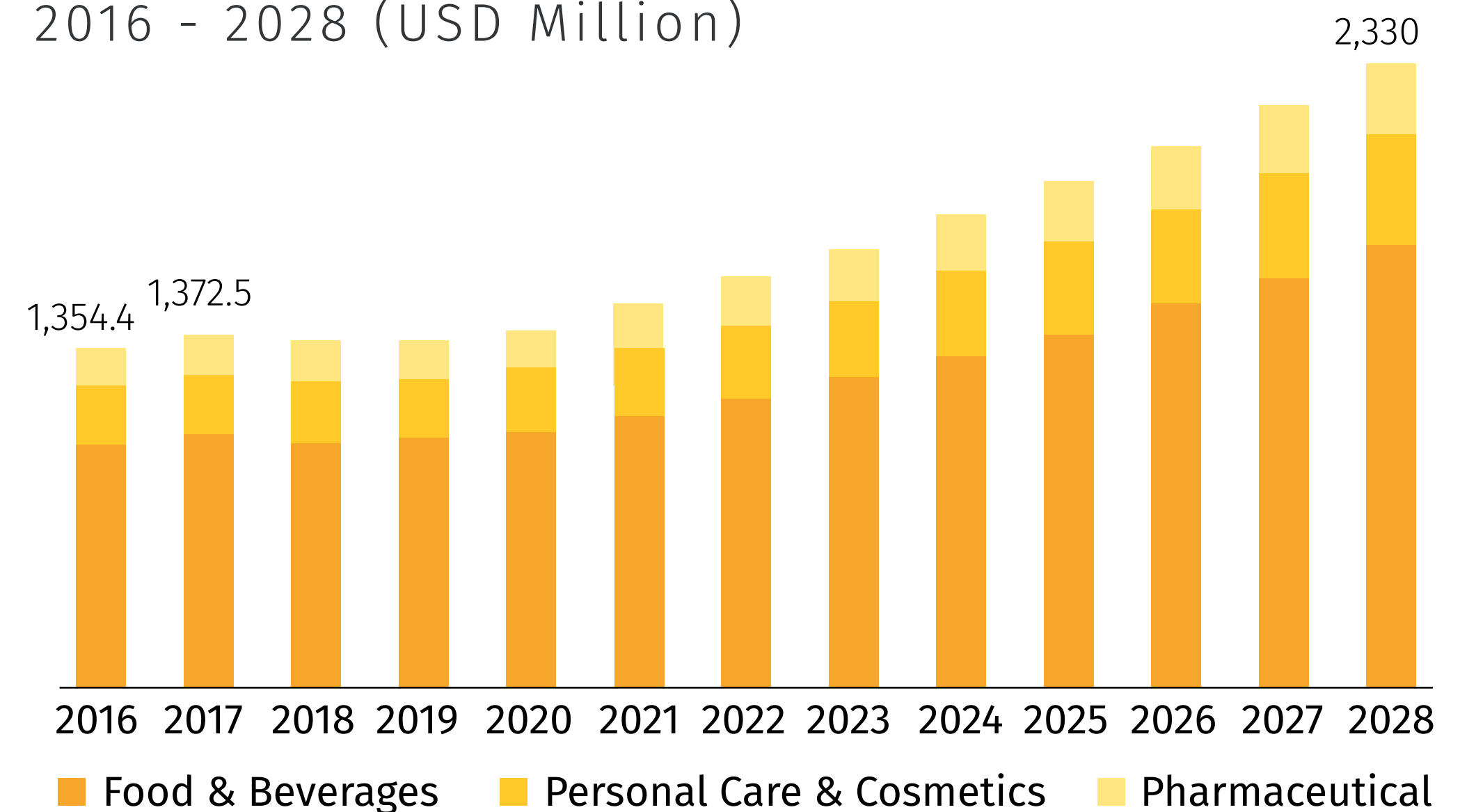
Honey	26%	31%
Granulated sugar (or white sugar)	23%	15%
Brown sugar	11%	8%
Non-calorie sweeteners (like Splenda or Sweet N Low)	9%	11%
Maple Syrup	9%	8%
Stevia	9%	12%
Other sugar (like sugar in the raw or turbinado)	4%	3%
Monk fruit	3%	3%
Agave nectar	3%	3%

Source: The attitude & Usage Study NHB | 2020

# THE U.S HONEY MARKET

- + Honey is an excellent source of numerous nutritional ingredients including vitamins, minerals, calcium, and antioxidants.
- + Honey has several medicinal properties and can help improve metabolic activities, maintain blood pressure levels, and can even heal burn wounds.
- + Honey is widely used in many applications: food & beverages, cosmetics and pharmaceuticals.

**The U.S honey market size, by application**  
2016 - 2028 (USD Million)



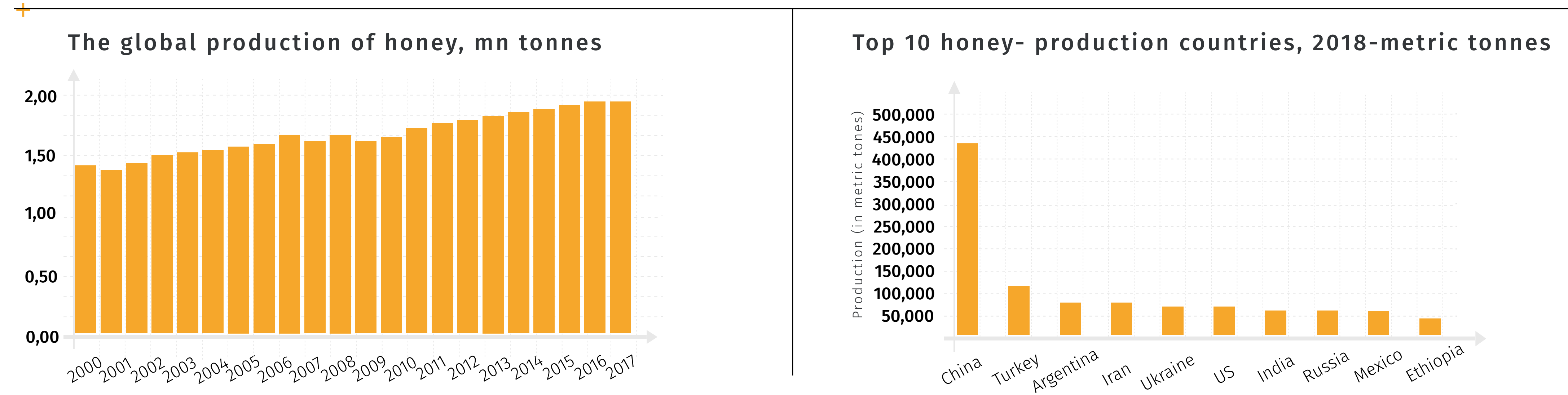
Source: Grand View Research



# THE GLOBAL PRODUCTION OF HONEY

**Global Production of honey is limited and, in some countries, declining due to different factors:**

- + moving away from honey production to pollination services.
- + Sensitivity of the Honeybee.
- + Climate changes and rain absence in many places in the world.



Source: The global honey market and Ukraine challenges and trends, Food and Agriculture Organization (FAO) of the United | FAO Statistics Division 2020



# OUR SOLUTION



# BEE-IO - PURE HONEY WITHOUT A BEE

## 02

### FILTRATION

Cleaning our nectar from unwanted substances and residue leftover from the Extraction stage.

## 03

### BEE-IO PROCESSING

Transforming the nectar into honey using Bee-io's innovative biosynthesis.

## 04

### EVAPORATION

Removal of excess water, to reach the honey texture familiar to us.

## 05

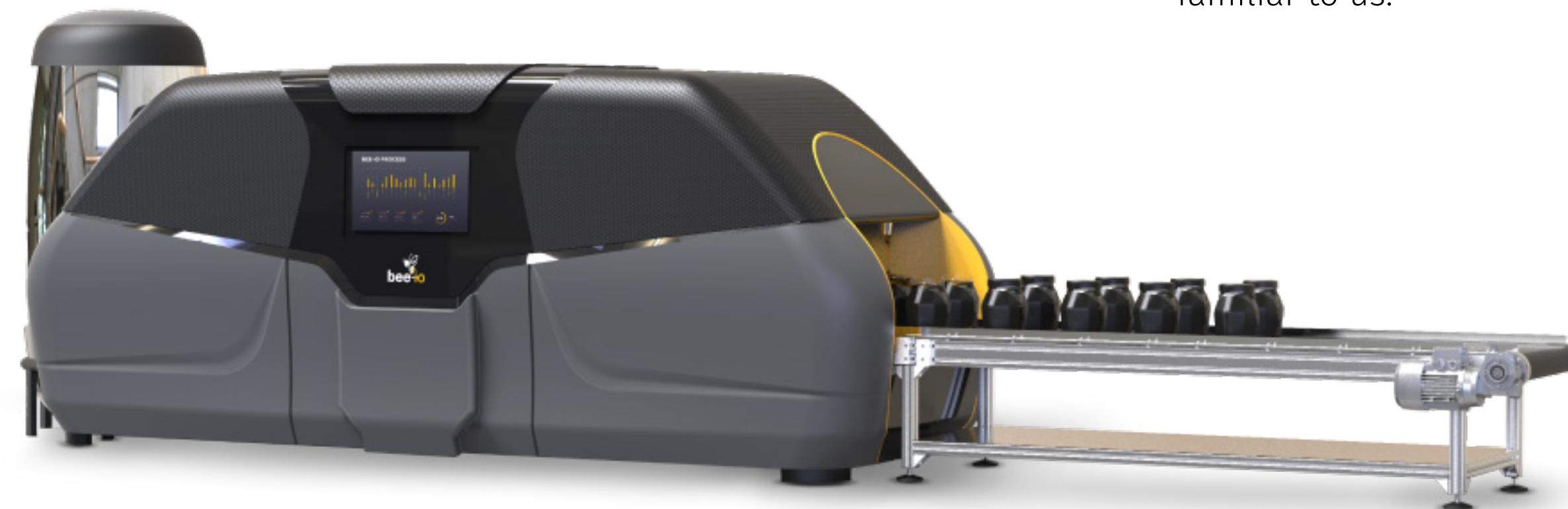
### HONEY

Our honey is ready! With the same qualities and wonderful taste, we all know and love.

## 01

### NECTAR PRODUCTION

Production of the sweetest nectar mother nature has to offer.



# KEY PLAYERS MAP

## Pure Honey



## Honey Substitutes



## Honey Based Cosmetics





# BEE-IO VS HONEY MARKET KEY PLAYERS

	PURE HONEY	VEGAN HONEY SUBSTITUTES	BEE-IO HONEY
100% mono- floral	✗	✗	✓
Baby safe	✗	✓	✓
Cost reduction	✗	✓	✓
Year-round production and short production time	✗	✓	✓
No toxins, no pesticides, and no antibiotics time	✗	✓	✓
Sustainable, Bee-less	✗	✓	✓
Honey varieties	✓	✗	✓
Medical properties	✓	✗	✓
Nutritional values	✓	✗	✓
Honey texture/flavors/aroma	✓	✗	✓

# INTELLECTUAL PROPERTY

2 patents pending  
(USPTO)

Flower nectar extraction

2 patents pending  
(USPTO)

Turning nectar into honey





# COLLABORATION WITH WORLD TOP RANKING INSTITUTES



## THE WEIZMANN INSTITUTE OF SCIENCE

- + Optimizing and developing new cutting-edge technology for nectar production.
- + Harnesses the innovation of **Prof. Asaph Aharoni** in plant sciences.



## MIT (MASSACHUSETTS INSTITUTE OF TECHNOLOGY)

- + Optimizing and developing new cutting-edge technology for cultured honey production.
- + Harnesses the innovation of **Prof. Ron Weiss** in synthetic biology.

# HONEY PRODUCTION PROCESS TODAY



- + This time-consuming process has not changed for decades.
- + Highly sensitive process which depends on many unexpected changes.
- + Pressure to use natural nectar substitutes.



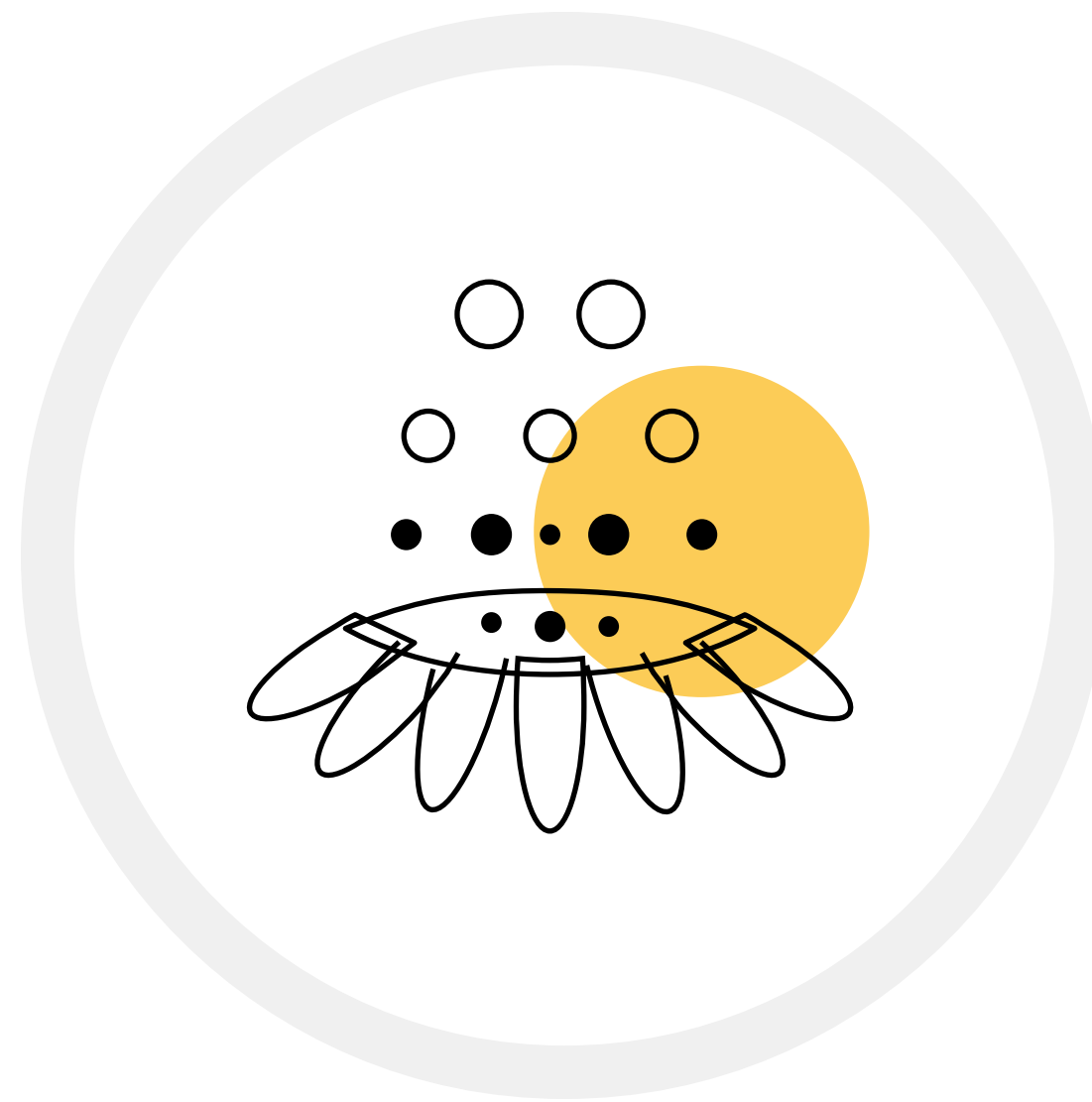
# MAIN CONCERNS



# THREE INHERENT PROBLEMS:



**ECONOMICAL**



**ENVIRONMENTAL**



**ETHICAL**

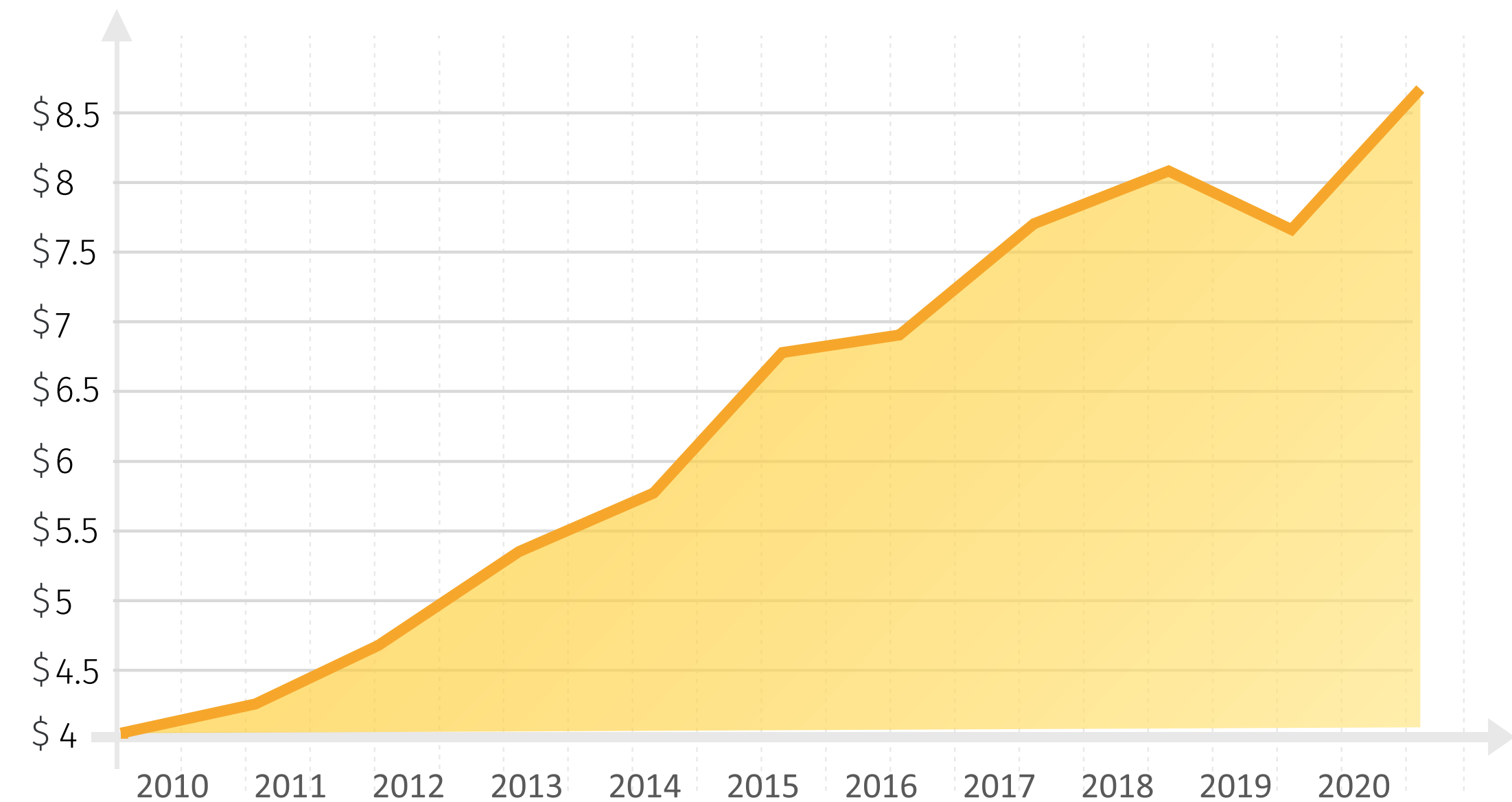




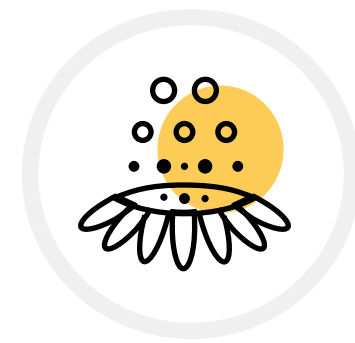
# ECONOMICAL

- + World consumption is increasing faster than production.
- + Honeybee populations are declining due to climate change, parasites, contaminations and viruses.
- + Honey is getting more expensive.

Average retail honey price per pound  
Across all reporting regions



Source: <https://adventuresinbeeland.com/2019/01/14/how-many-honey-bees-are-there-a-2019-update/>  
<https://www.honey.com/honey-industry/statistics/retail-honey-price> (Data from Bee Culture magazine)

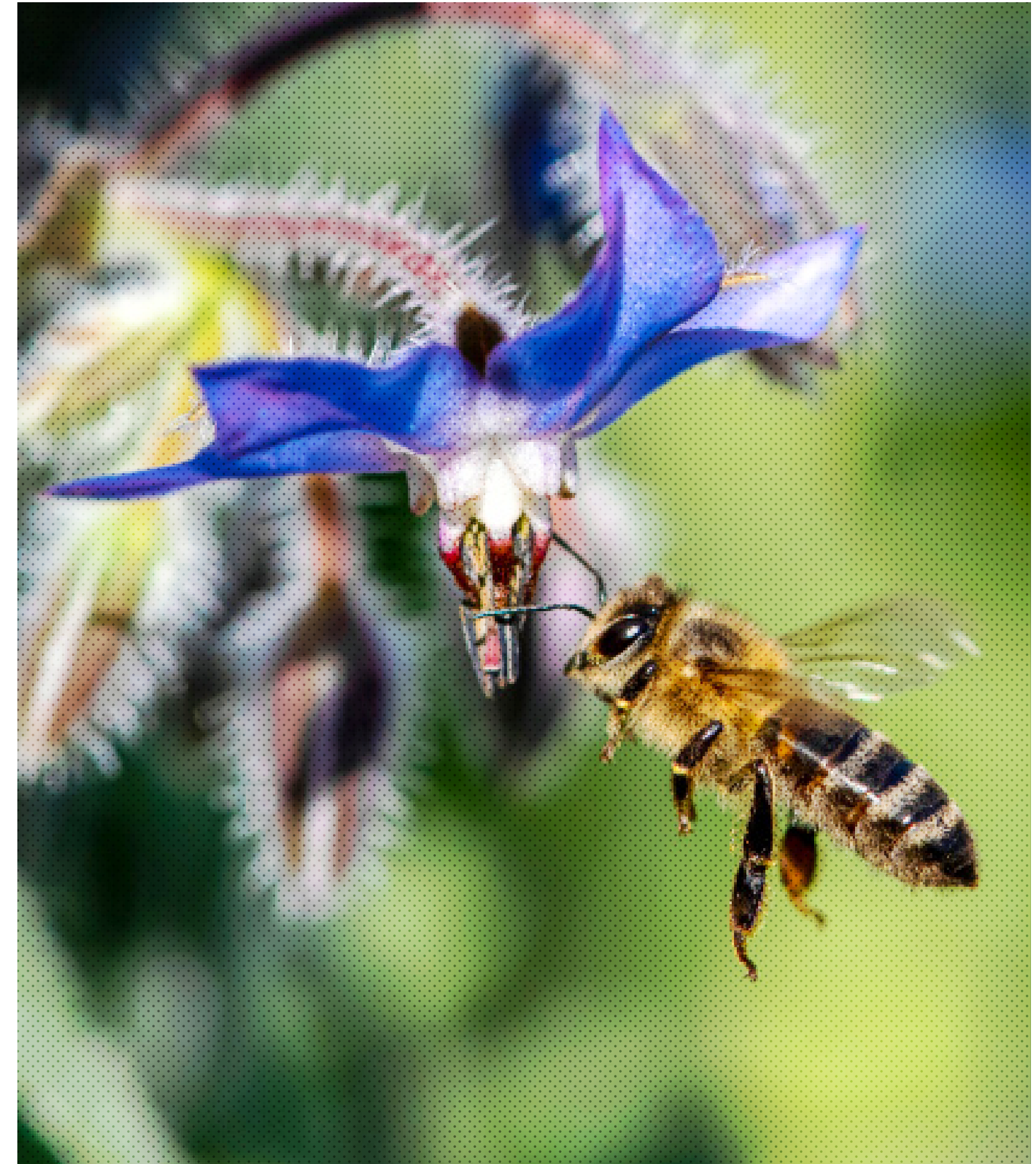


# ENVIRONMENTAL

“  
Albert Einstein: *“If the bee disappeared off the surface of the globe then man would only have four years of life left. No more bees, no more pollination, no more plants, no more animals, no more man.”*  
”

Current honey manufacturing has led to:

- + Less native pollinator
- + The mysterious Colony Collapse Disorder (CCD)
- + Increased vulnerability of honeybees
- + Climate changes, desertification and rain absence in many places in the world, reduce the number of flowers and flowers nectar.

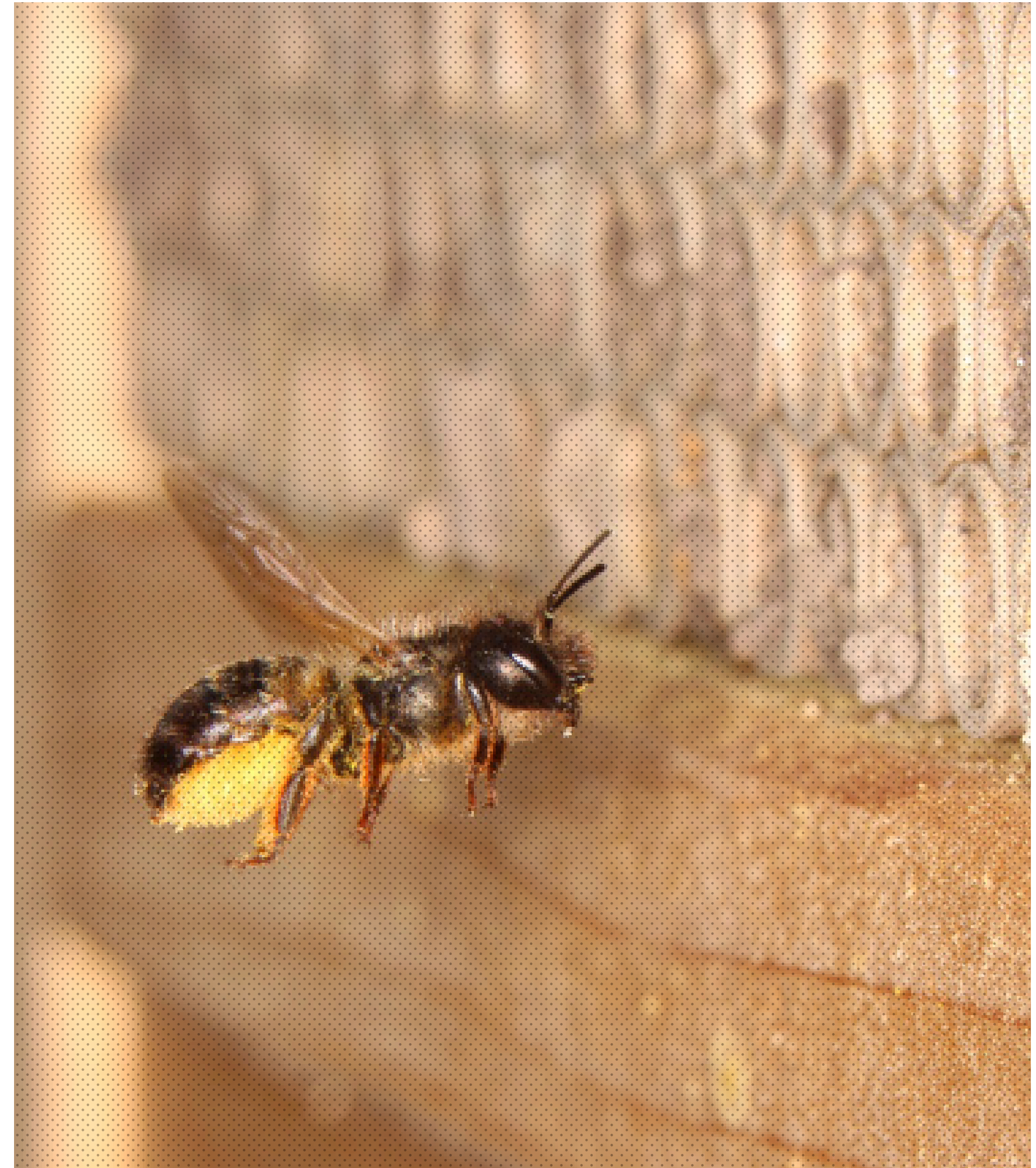






## ETHICAL

- + Honeybees are bred and managed as factory-farmed animals with poor conditions including stress in transportation, injuries and living in dense conditions.
- + The large amount of managed bees has accelerated the reduction of many other bee species around the world.
- + Humans choose to eliminate entire colonies by taking all their honey in cold seasons.



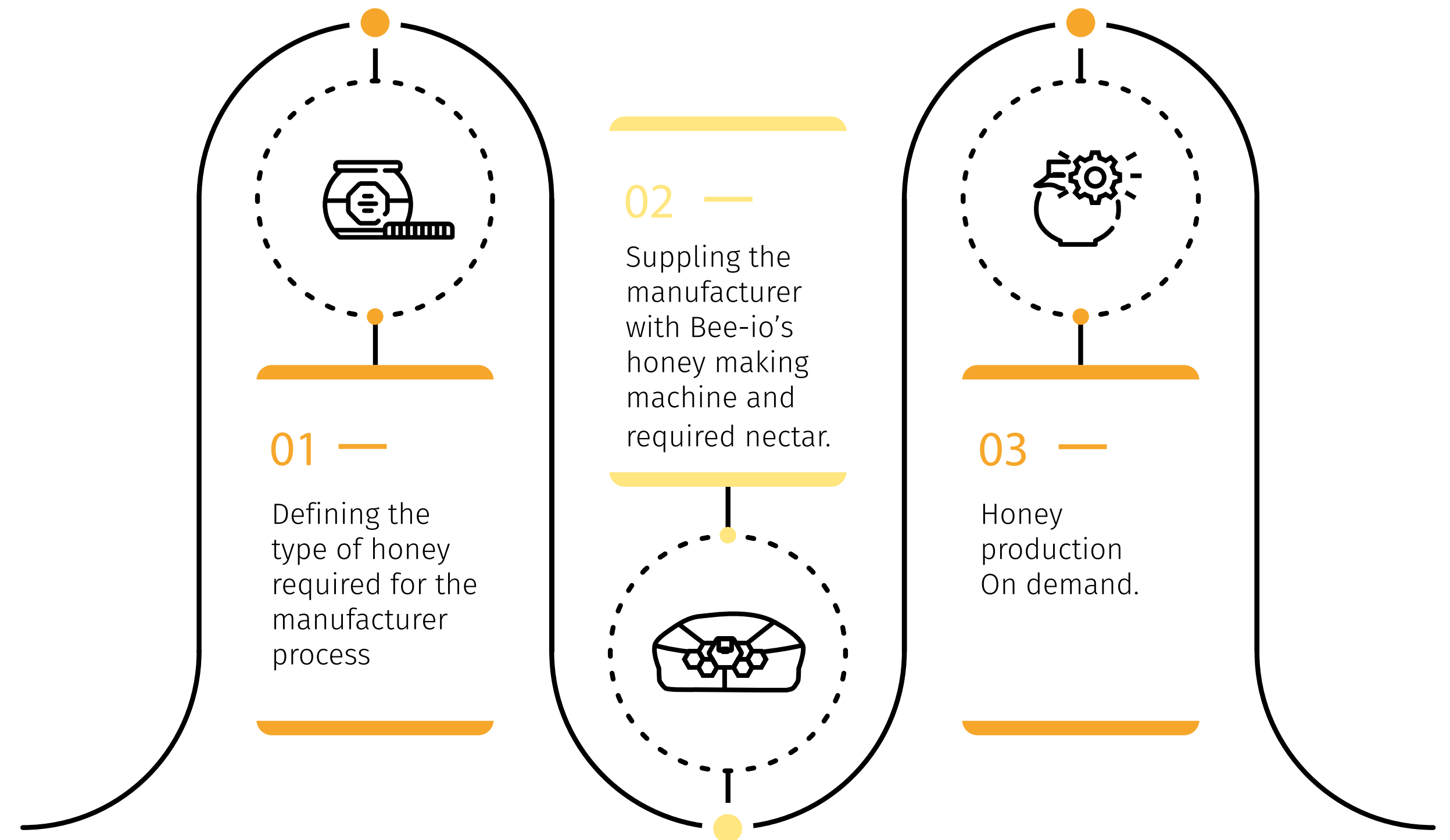


# BUSINESS PLAN

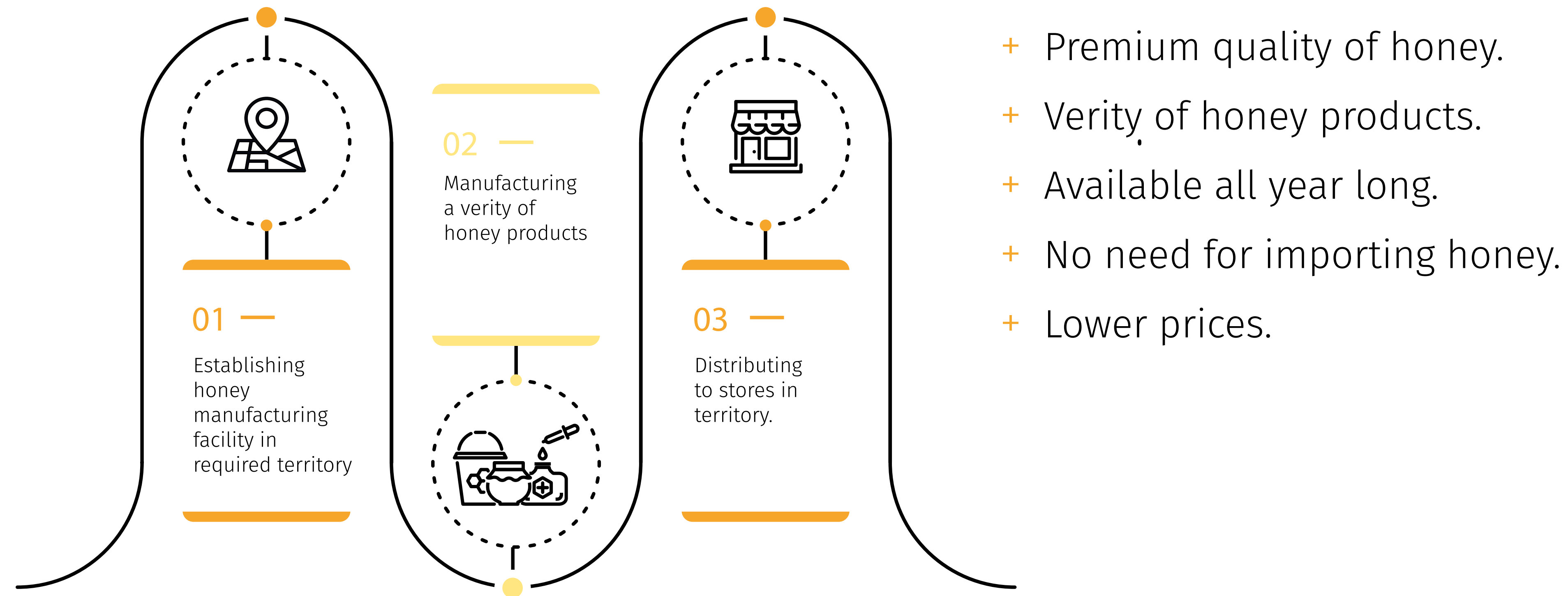


# OUR BUSINESS MODEL FOR THE INDUSTRIAL NEEDS

- + High and constant premium honey.
- + Available on demand.
- + Short production time.
- + Perfectly fitting the complete industrial process and the end-product.
- + Cost reduction.



# OUR BUSINESS MODEL FOR DISTRIBUTION IN TERRITORY





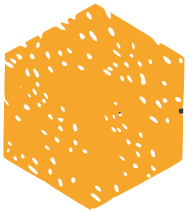
# ROADMAP



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THANK YOU!

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