

## The ingredients of beer and Kirin's commitment



We use water that has been refined with Kirin's proprietary water treatment technology and has passed rigorous screening standards



We use yeast selected specifically for each product from a bank of about 1,000 yeast varieties



Made from selected barley meeting numerous quality standards

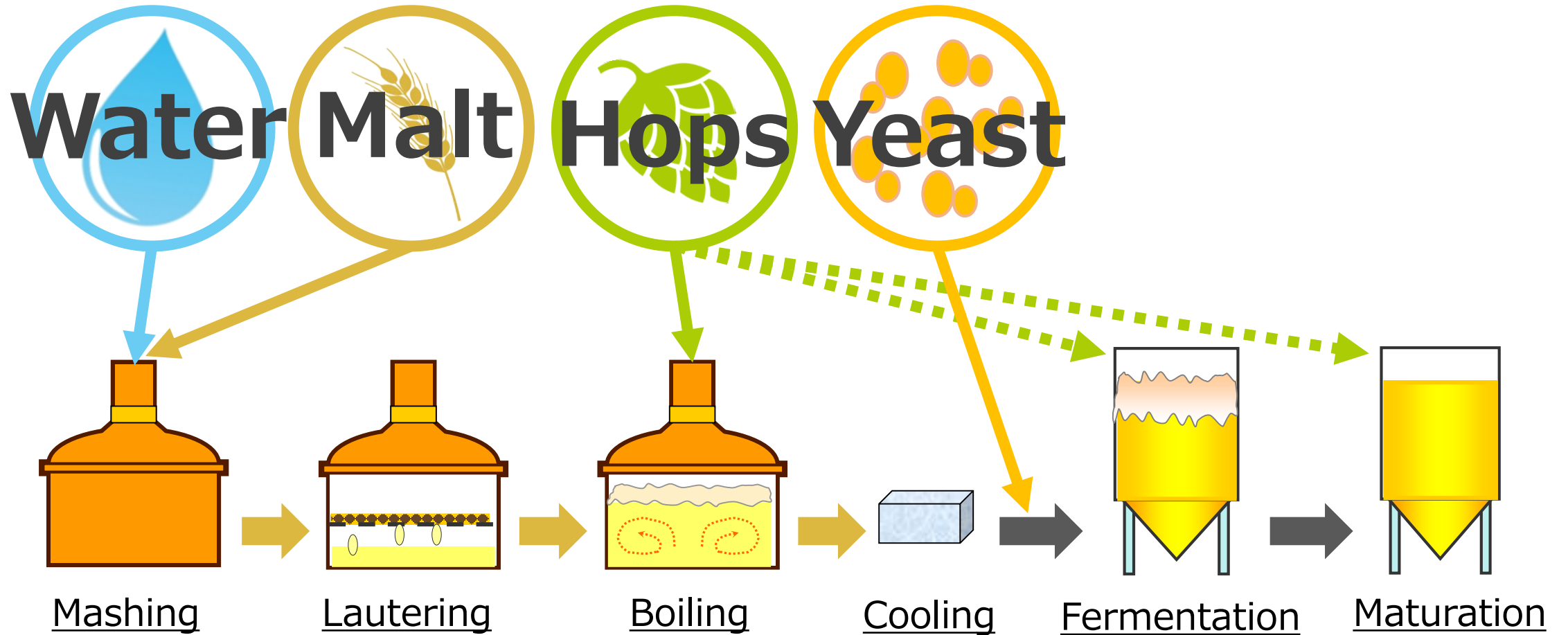
➔ **The only beer brewery in Japan with in-house malting (Fukuoka)**



Every year, our experts visit hop-producing areas in Japan and abroad, and use all five senses to select the best hops

**Japanese hops**  
➔ **We use about 70% of hops produced in Japan (Tohoku region)**

# The brewing process



## The role of barley in brewing

Malt provides nutrients for yeast fermentation while at the same time giving the beer its flavor and aroma

### Malt = sprouted barley



Sprouting generates the enzymes necessary for growth

➔ These enzymes are important in brewing

### Types of grains

- Barley is most commonly used
- Wheat and other ingredients are also used in some beers, including craft beers

### Degree of roasting malt

- Dark beers have a higher percentage of roasted dark malt
- The use of dark malt gives dark beers a savory, smoky flavor

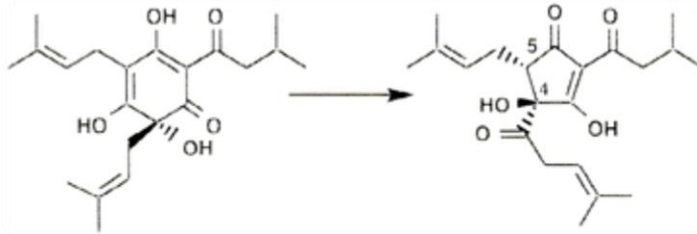


# The role of hops in brewing

## The role of hops in brewing beer

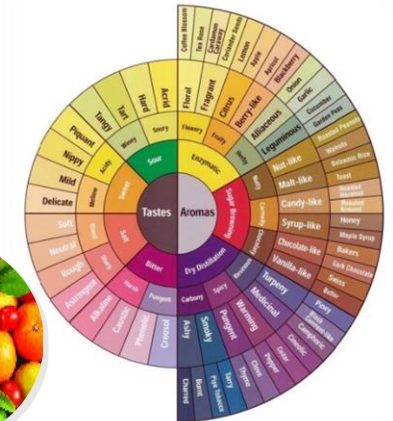
### Bitterness

- The alpha acids in the hops added during the wort boiling process are isomerized to become iso-alpha acids (the main source of bitterness).



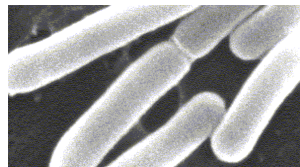
### Aroma

- A range of aromas may be produced depending on the variety of hops and the timing of their addition



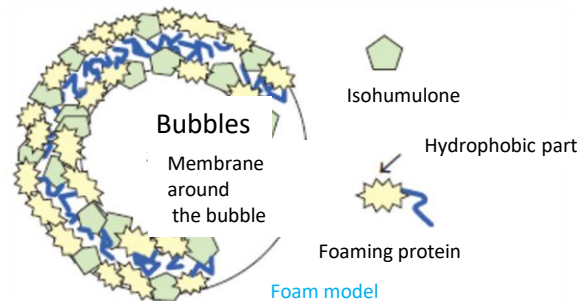
### Antibacterial action

- Inhibits the growth of haze-producing bacteria, such as lactic-acid bacilli, and improves the shelf life of beer



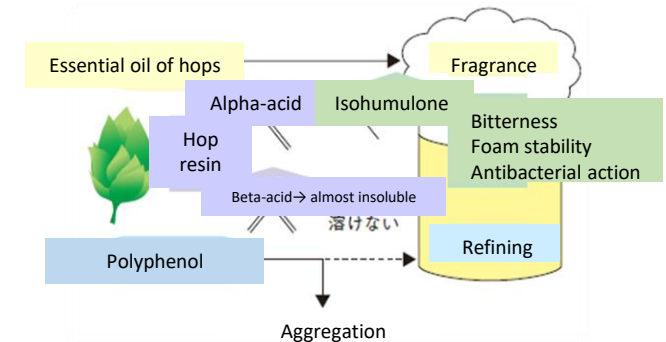
### Foam formation

- Iso-alpha acids act as an important factor in foam formation, and contribute to foam quality



### Stability

- Solidifies and refines excess protein in the wort



Kirin's unique technologies

Kirin has developed a range of proprietary technologies to control beer ingredients

## → Creating New Raw Materials

- Creating a diverse range of flavors through selective breeding of raw materials

## → Creating a New Production Method

- Driving the evolution of flavor with innovations in raw material processing and manufacturing processes

## → Creating New Value

- Utilizing ingredients derived from raw materials to add health-promoting properties



## Kirin's key technologies (1)

### Technology employing frozen raw hops (produced in Japan)



Usually  
dried after  
harvest



#### Pellets

- Excellent storage stability, transportability and handling at production sites



Shipped "raw" on the day of harvest



Frozen milling



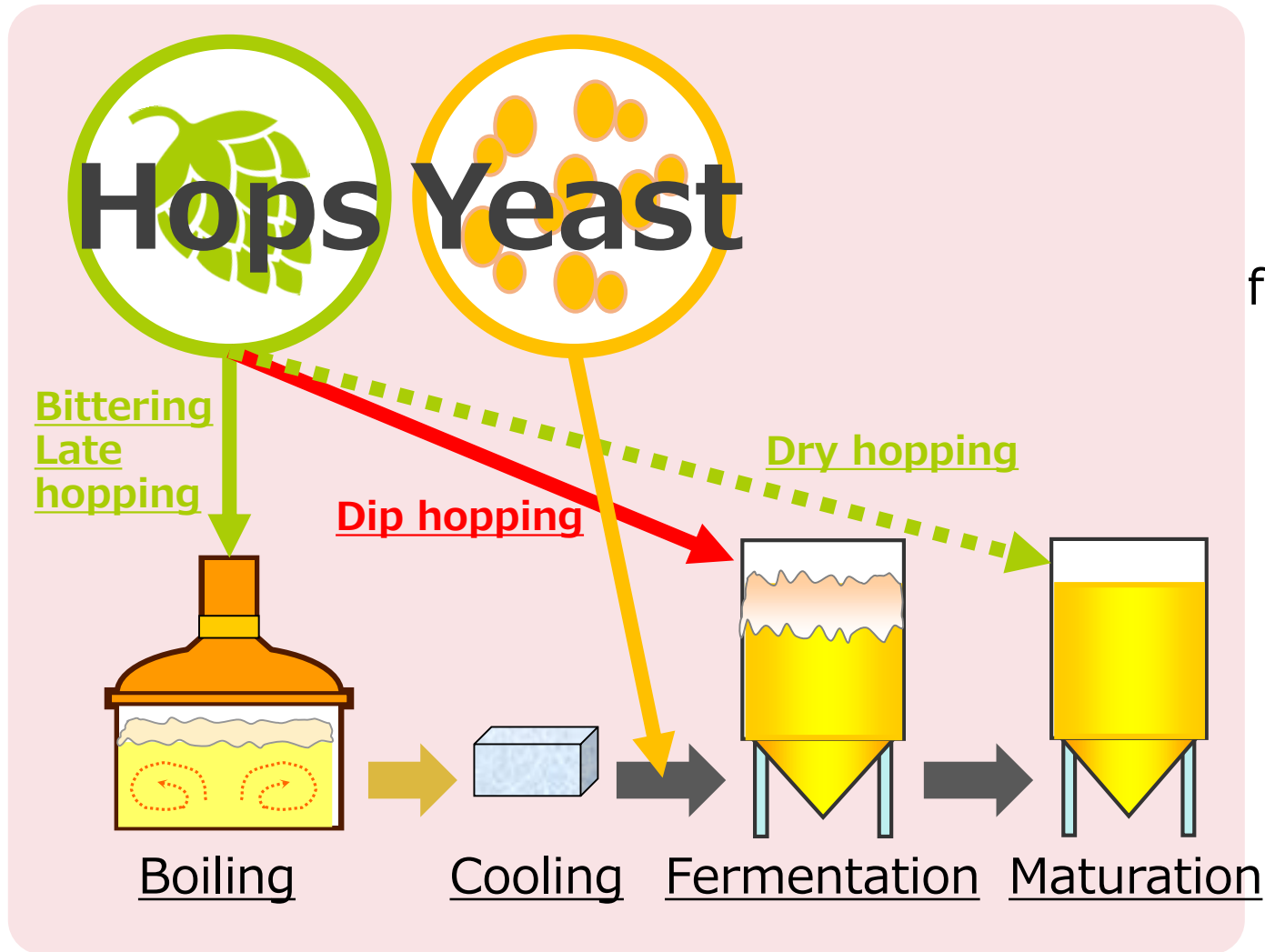
"Raw" hops are placed into the machinery manually



17th year on the market!

## Kirin's key technologies (2)

### Kirin's Original Dip hopping



## Dip hopping technology

Dipping the hops during fermentation suppresses excessive bitterness and pungent odors while leaving plenty of pleasant hop aroma



What does breeding/variety improvement consist of?

Breeding is the creation of genetic populations (= new varieties) with new properties



**When creating a new variety, Kirin's strength lies in its ability to evaluate brewing characteristics in addition to cultivation characteristics based on years of plant research**



Kirin's original variety, MURAKAMI SEVEN

Kirin is uniquely capable of creating shared value (CSV) by simultaneously adding value to its products (thus improving profitability) and maintaining the production of hops in Japan (thus revitalizing local economies)

## MURAKAMI SEVEN



### Appeal for brewers (brewing characteristics)

A unique aroma unlike any other in the world  
➔ "figs, muscats, Japanese citrus fruits"



### Appeal for producers (cultivation characteristics)

Excellent cultivation properties

➔ "Allows high yields and labor-efficient cultivation"

