



*La Rochelle, 27.11.06*

**Shelf-life of bag-in-box wine  
and consumer preference**

*Arcus*

- Arcus AS has more than 80 years of experience as supplier and producer of wine and spirits.
- Arcus AS is today the largest supplier in Norway of wine and spirits to Vinmonopolet and the Horeca (hotel and restaurant) trade.
- Arcus AS works within three categories; spirits, wine and FAB. Spirits is the largest category, and generates 62% of total turnover.
- Arcus AS produced 14 million litres in 2005.



# The wine market in Norway



- Vinmonopolet has the exclusive right to retail wine, spirits and strong beer in Norway.
- The products are purchased through importers holding the required licence for import. More than 130 importers have signed this agreement, and one of them is Arcus.
- By the end of 2005 there were 198 Vinmonopolet-shops in Norway.

# Wine consumption in Norway



- Red wine had a marketshare of 73,2% in 2005
- Bag-in-box (BIB) contributed to 50,9% of the total volume of wine sold in 2005
- In 2005, approximately 340 different brands of BIB were available at Vinmonopolet

## Gammel pappvin på Polet

Kilde: [www.nrk.no](http://www.nrk.no)



Merkingen av pappvin som selges i Norge er under enhver kritikk, mener vinkspert. Kundene har litt til å velge mellom, og de orker ikke å velge mellom dem som er gamle på...

**SIDEN VIN I KARTONG** taper seg fortere enn tilsvarende vin på flaske, burde det bli konsumentkrav om tydelig holdbarhetsmerking på kartong. Likhet mellom merke og flaske er viktig.

Nå er det stort sett bare krydder og produksjonskoder, en hederlig flaske og en fargeant de 30 kartongene testes var et par år. Vinskeviner der det er en god datumsantallet er...

Kilde: [www.dagbladet.no](http://www.dagbladet.no)



Holdbarhet på pappvin

Kilde: [www.artoftaste.no](http://www.artoftaste.no)

(24.03.2010 23:10)  
Av: Arcus  
Men selv om holdbarheten er tydelig merket, er det...

Hva holdbarhet angår, er Bag-in-Box ferskvare, og ikke egnet for lagring. Regn med maks 3-4 måneder på et kjølig sted etter innkjøp. Etter at du har åpnet kartongen, bør du drikke vinen opp innen en uke eller to.

Kilde: [www.artoftaste.no](http://www.artoftaste.no)

# CONFUSION

# Background for the project



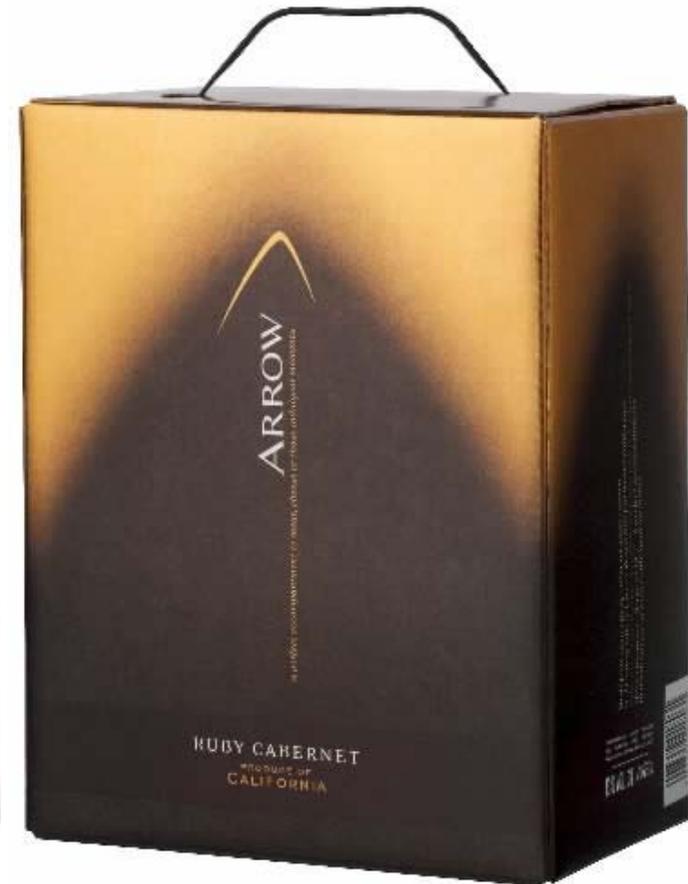
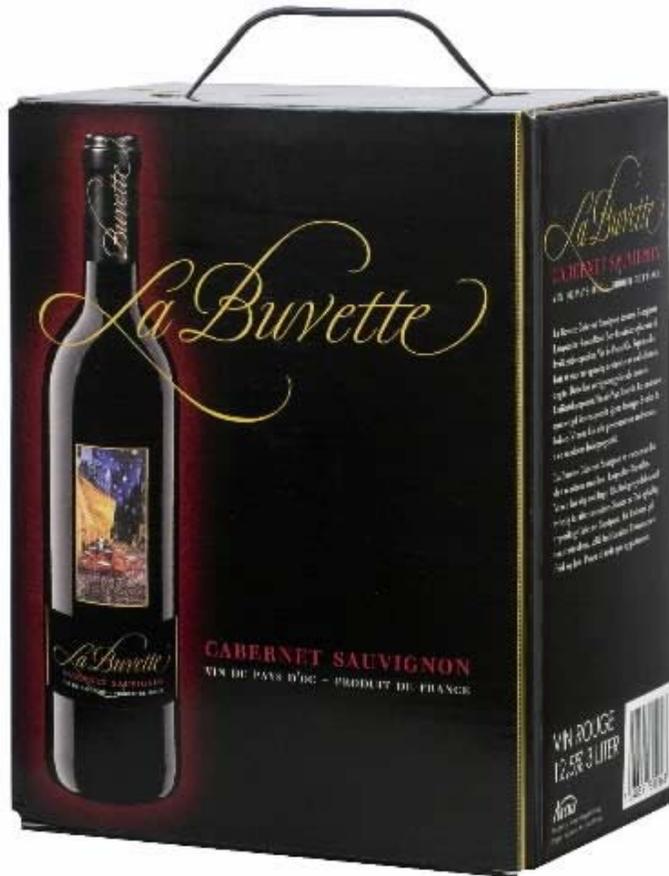
- Shelf-life of bag-in-box is of current interest, because of both public and governmental interest in the labelling of BIB with “best before date”.
- Both Sweden and Finland are now demanding labelling of the filling-date on all BIB.
- Quality control evaluated by an expert panel is often not comparative with consumers acceptance of a product.

## *Shelf-life of bag-in-box wine and consumer preference*

- The purpose of this project was to answer these questions:
  - “At what storage-time do consumers feel a sensory difference between a red wine stored in a bottle and a bag-in-box?”
  - And which one do they prefer?”



# What about these two brands?



## **Consumertest**

- Consumers were presented for the wines after 3, 6, 9, 12 and 15 months of storage.
- The same consumers were participating each time.

## **Trained assessors**

- The sensory panel at Arcus AS were evaluating the same wines at the same time as the consumers.

## **Products**

- Filled in January 2005
- Stored at 12°C

- 10 “homeleaders” were selected, all working at Arcus or Matforsk
- Each homeleader recruited 5-8 friends to join the tests in a home environment, the same consumers attended all of the five tests.
- Requirement for the consumers:
  - Drinks wine at least once a week
- 63 consumers were recruited
- Presented for a preference test and a triangular test after 3, 6, 9, 12 and 15 months of storage, tested bottle vs BIB for each brand
- The samples were presented blind, and the consumers did not know the intention of the project

# Trained assessors

- Sensory panel at Arcus AS
- Experts on wine
- Presented for a triangular test, between bottle and BIB, for both products every 3 months
- Carried out a profiling of all the four samples after 3, 6, 9, 12 and 15 months
- For the profiling they used the eight attributes they know and are trained on for red wine
- All the tests were carried out blind



# **Results**

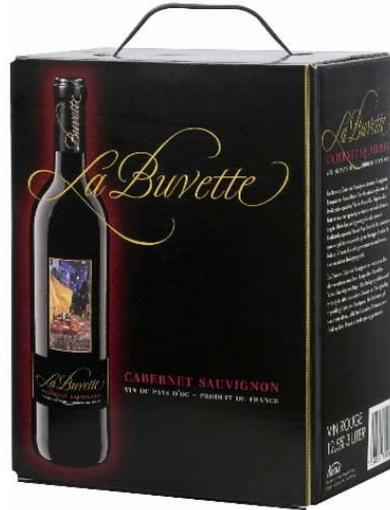
## **Consumer-tests**

# La Buvette, triangular tests, bottle vs BIB

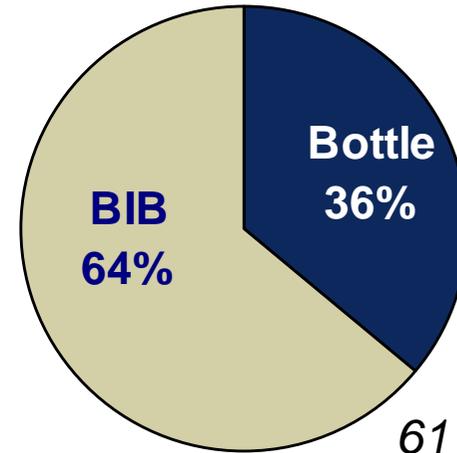
<b>La Buvette</b>	<b>Correct answers / total participants</b>	<b>Significance? <math>p &lt; 0,05</math></b>
3 months	24/63	No
6 months	17/52	No
<b>9 months</b>	<b>30/61</b>	<b>Yes</b>
<b>12 months</b>	<b>28/52</b>	<b>Yes</b>
<b>15 months</b>	<b>19/41</b>	<b>Yes</b>

# Preference test, bottle vs BIB

- When the consumers feel a significant difference, do they prefer bottle or BIB?

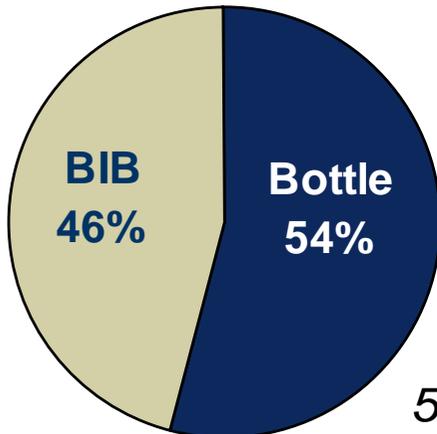


## La Buvette, 9 months



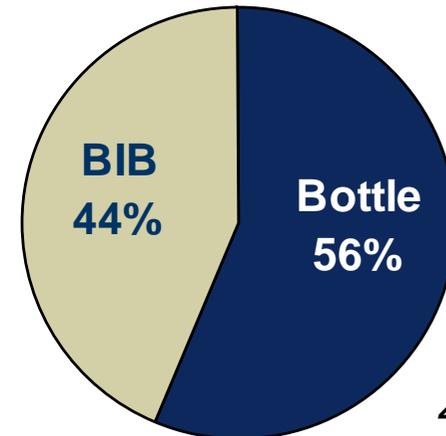
61 consumers

## La Buvette, 12 months



52 consumers

## La Buvette, 15 months



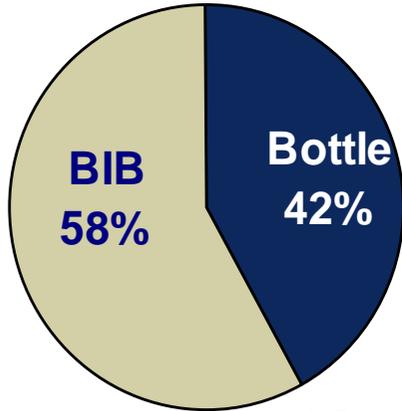
41 consumers

# Arrow, triangular tests, bottle vs BIB

<b>Arrow</b>	<b>Correct answers / total participants</b>	<b>Significance? p &lt; 0,05</b>
3 months	25/63	No
<b>6 months</b>	<b>30/52</b>	<b>Yes</b>
<b>9 months</b>	<b>36/61</b>	<b>Yes</b>
<b>12 months</b>	<b>24/52</b>	<b>Yes</b>
<b>15 months</b>	<b>22/41</b>	<b>Yes</b>

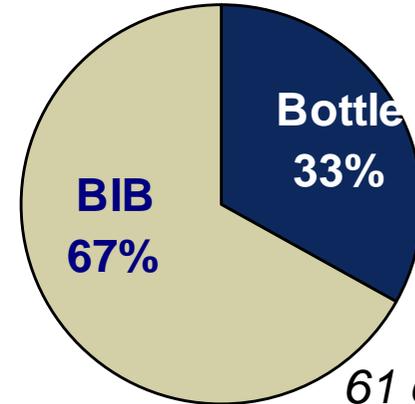
# Preference test, bottle vs BIB

## Arrow, 6 months



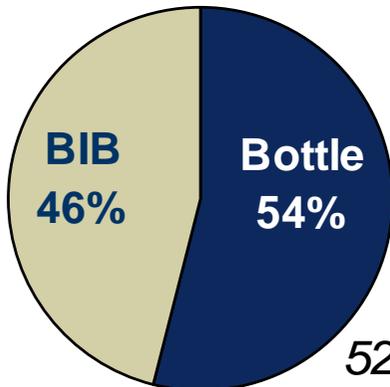
52 consumers

## Arrow, 9 months

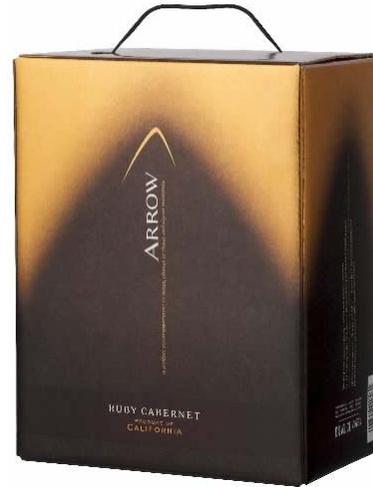


61 consumers

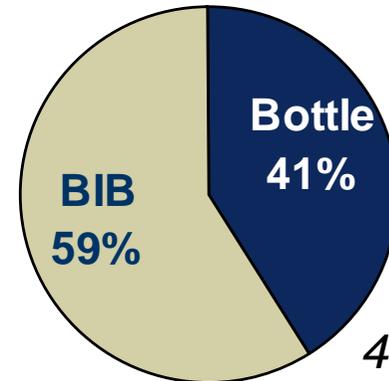
## Arrow, 12 months



52 consumers



## Arrow, 15 months



41 consumers

# **Results**

## **Trained assessors**

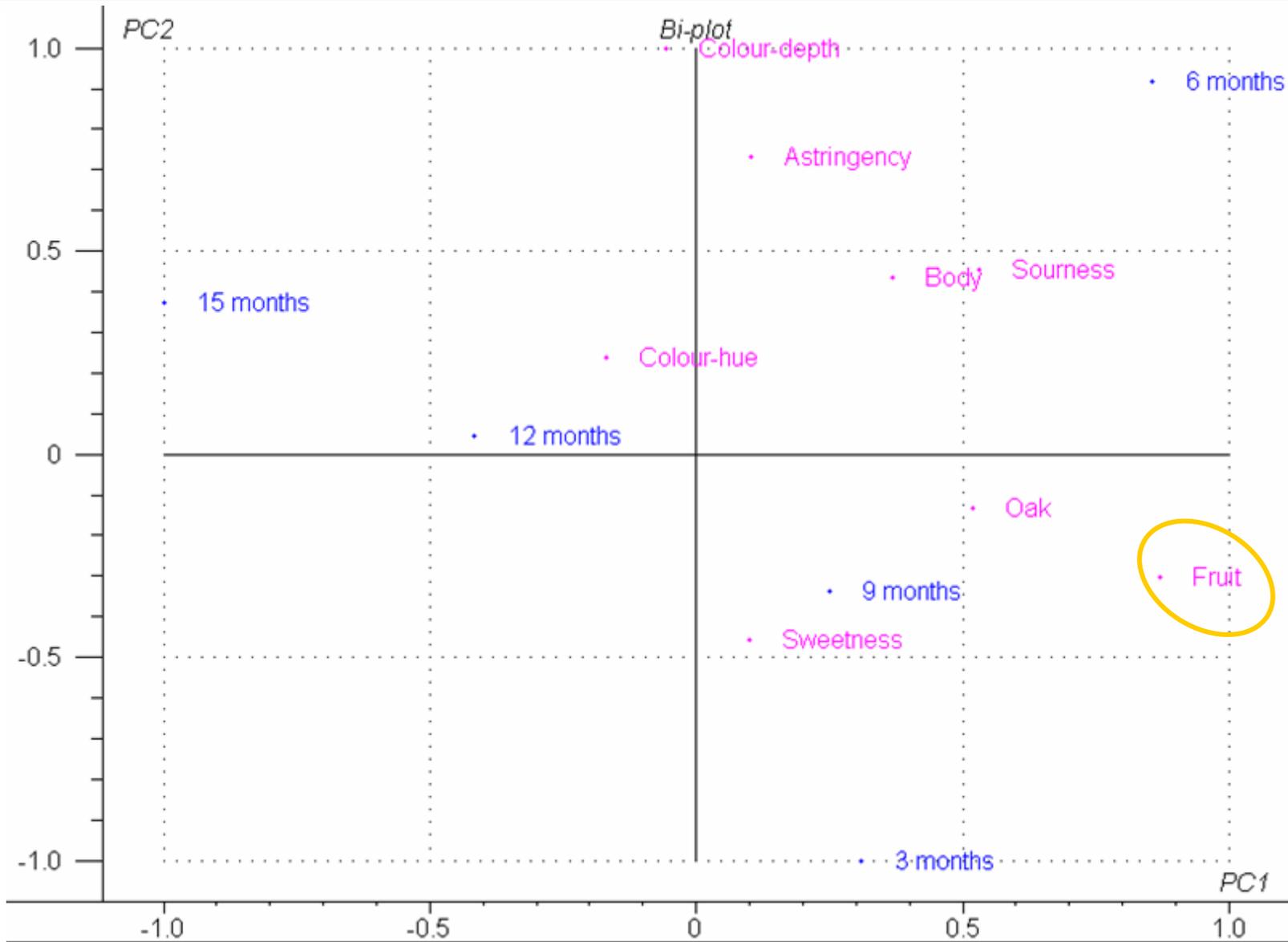
# La Buvette, triangular tests, assessors

<b>La Buvette</b>	<b>Correct answers / total participants</b>	<b>Significance? p &lt; 0,05</b>
3 months	4/7	No
<b>6 months</b>	<b>9/11</b>	<b>Yes</b>
<b>9 months</b>	<b>10/12</b>	<b>Yes</b>
<b>12 months</b>	<b>10/12</b>	<b>Yes</b>
<b>15 months</b>	<b>7/10</b>	<b>Yes</b>

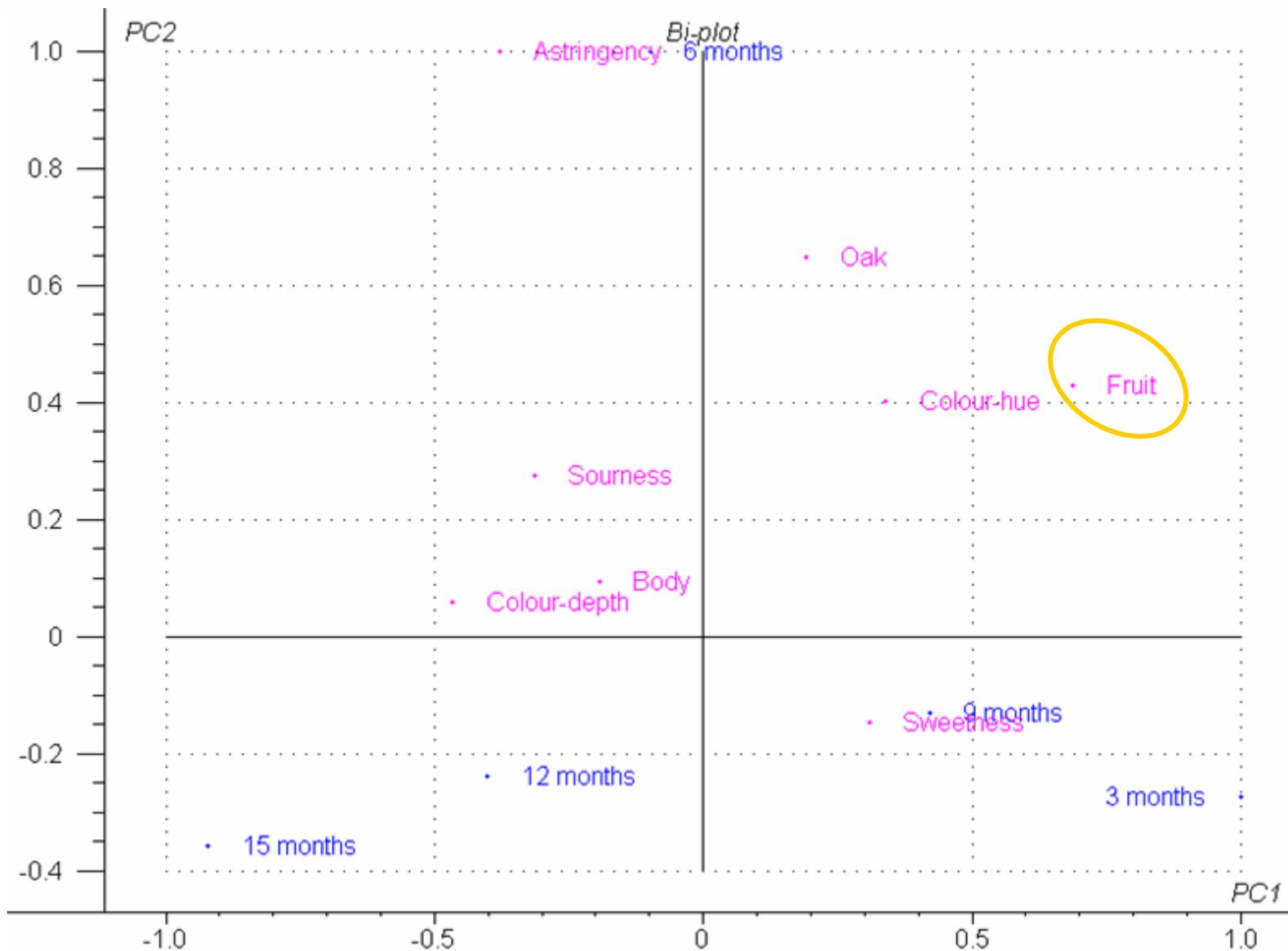
# Arrow, triangular tests, assessors

<b>Arrow</b>	<b>Correct answers / total participants</b>	<b>Significance? <math>p &lt; 0,05</math></b>
<b>3 months</b>	<b>6/7</b>	<b>Yes</b>
<b>6 months</b>	<b>11/11</b>	<b>Yes</b>
<b>9 months</b>	<b>8/12</b>	<b>Yes</b>
<b>12 months</b>	<b>9/12</b>	<b>Yes</b>
<b>15 months</b>	<b>8/10</b>	<b>Yes</b>

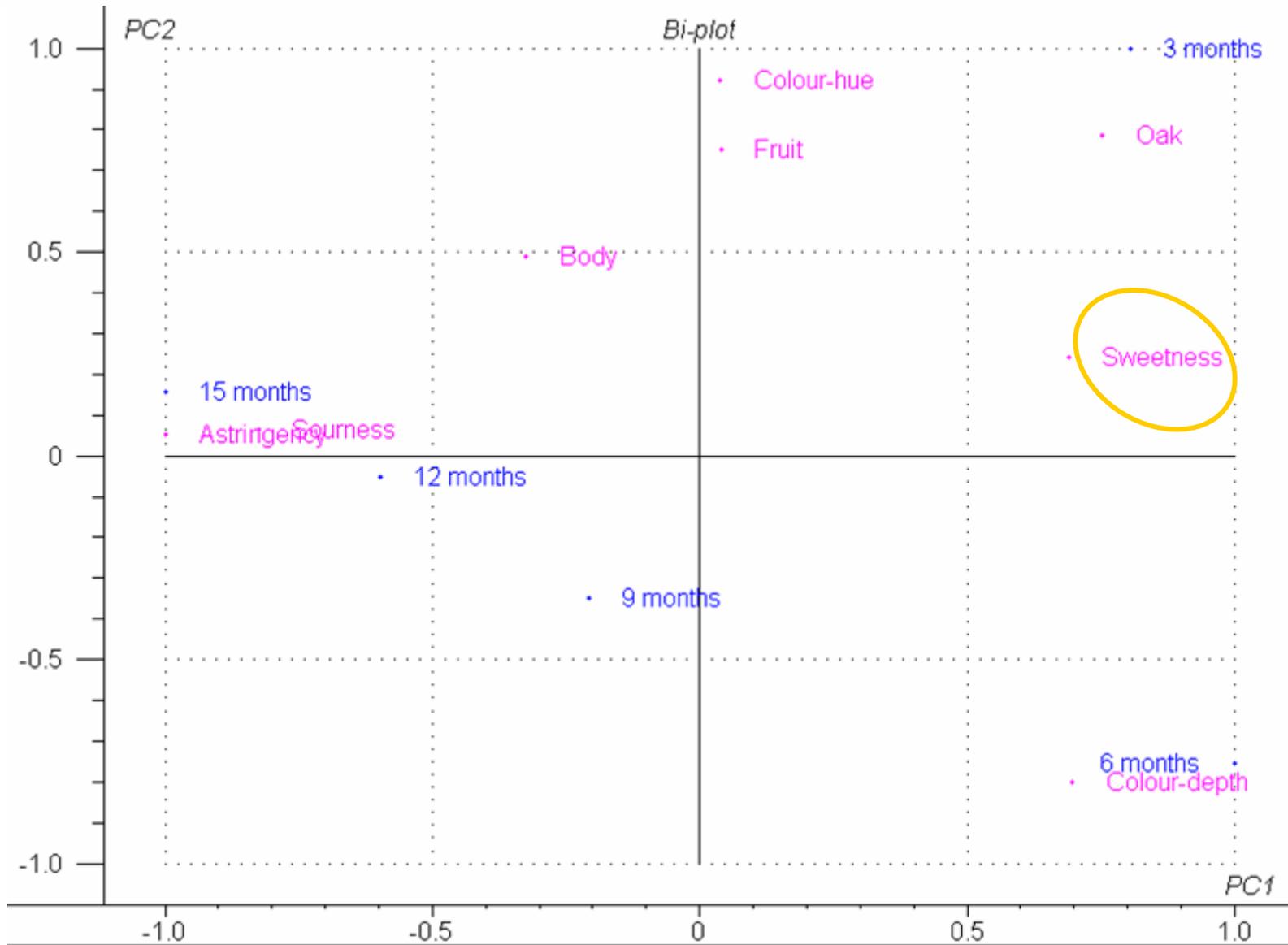
# La Buvette, bottle 3-6-9-12-15



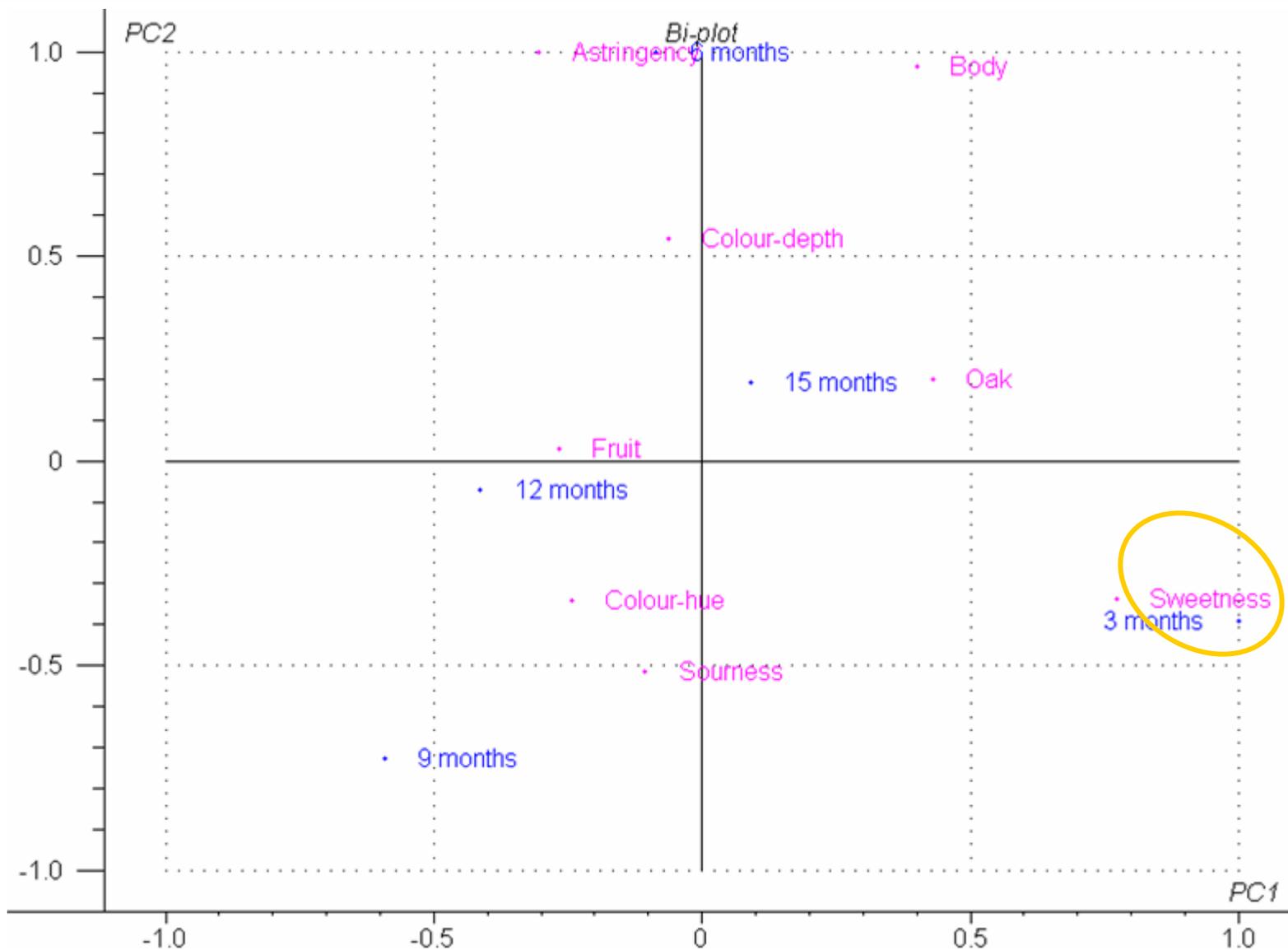
# La Buvette BIB 3-6-9-12-15



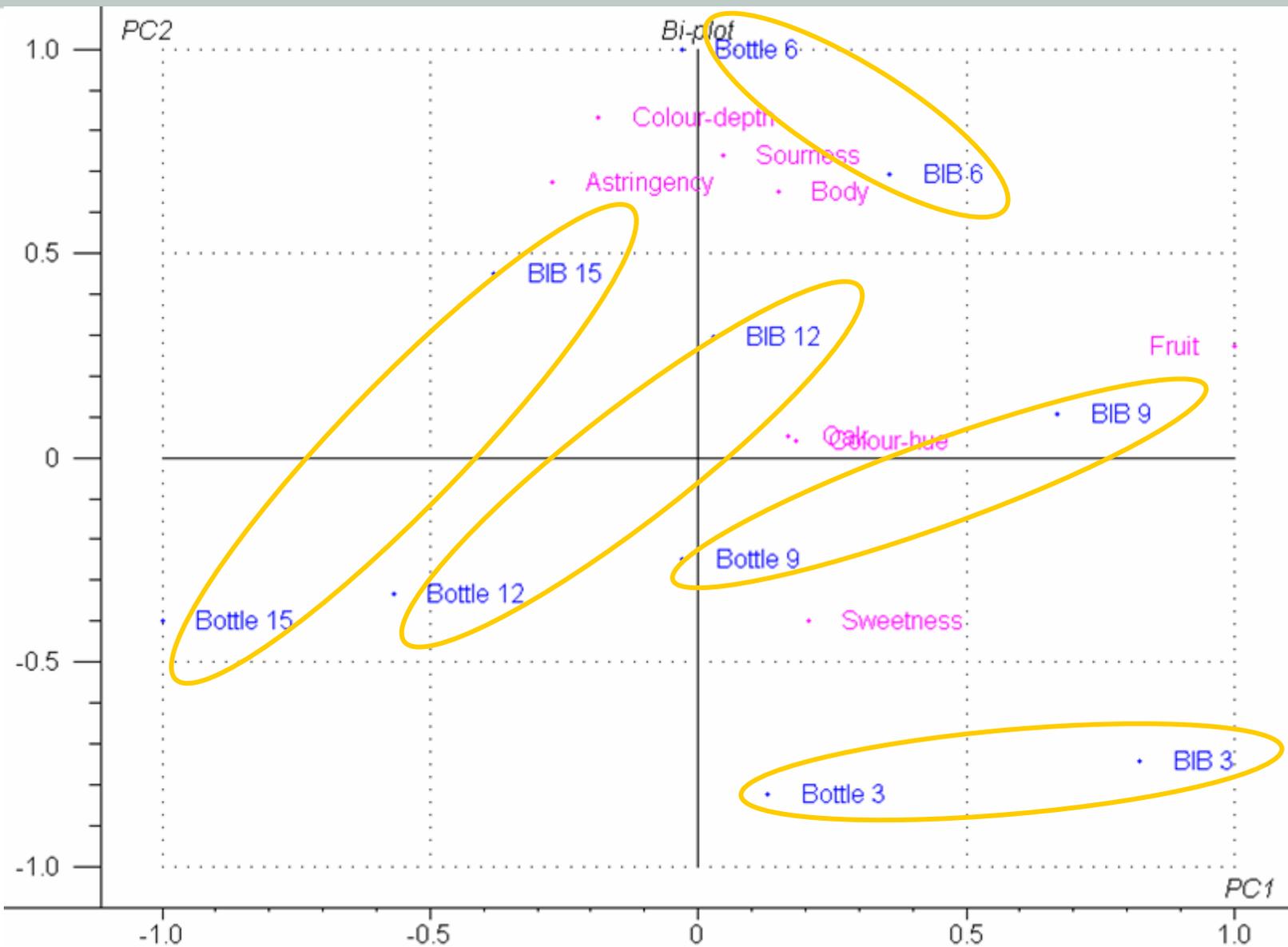
# Arrow, bottle 3-6-9-12-15



# Arrow BIB 3-6-9-12-15

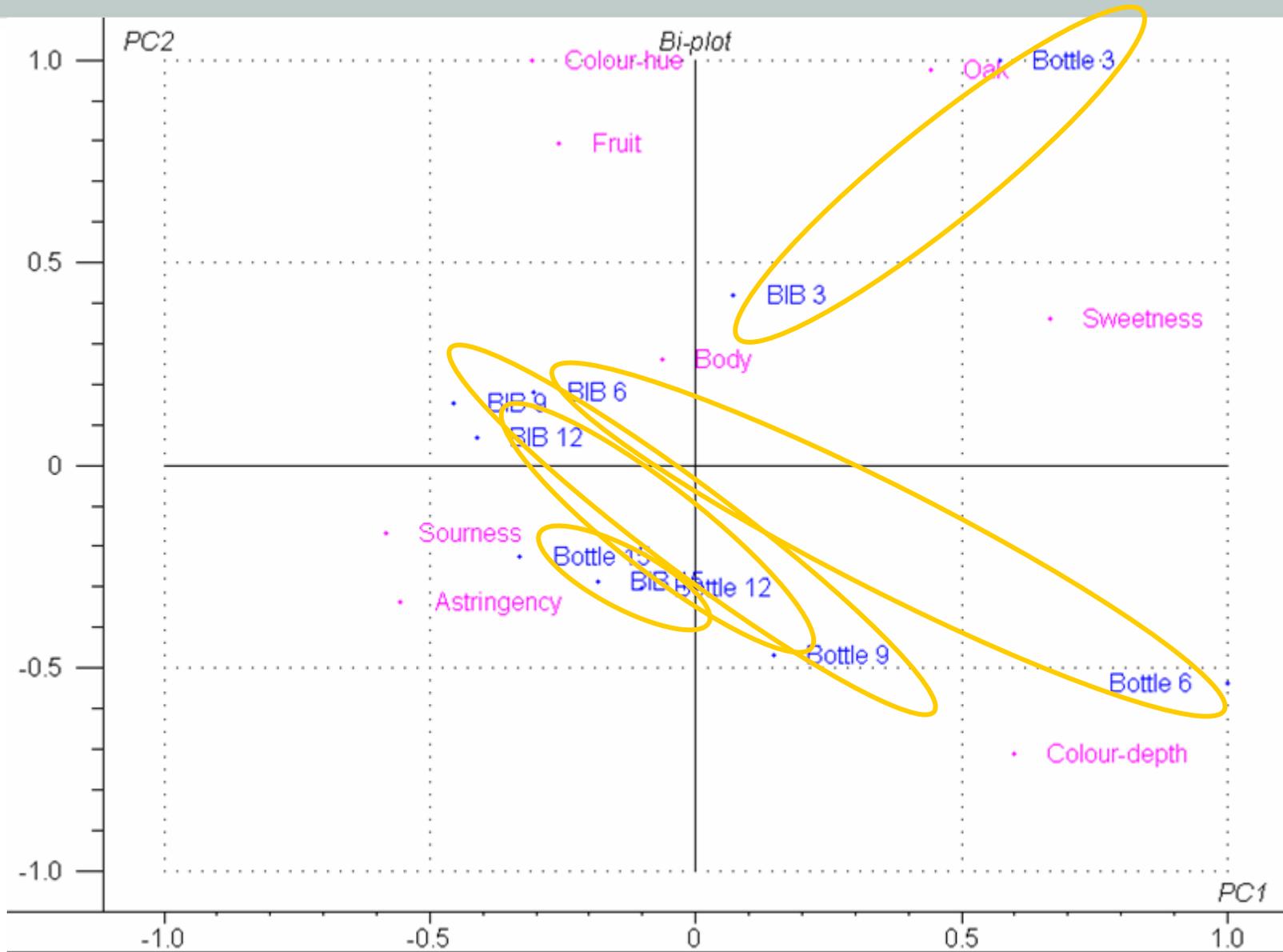


# La Buvette, bottle vs BIB



Buvette versus, X-expl: 44%, 28%

# Arrow, bottle vs BIB



- Few consumers give a high margin of error for the preference-test
- Proxy-effect
- Quality-faults on the products, for example cork-taint in the bottle



## Consumers

- Felt a sensory difference between bottle and BIB after 9 months of storage for La Buvette
  - They preferred the BIB at 9 months, at 12 and 15 months they preferred the bottle
- For Arrow a sensory difference between bottle and BIB were detected at 6 months.
  - The consumers preferred the BIB at 6, 9 and 15 months

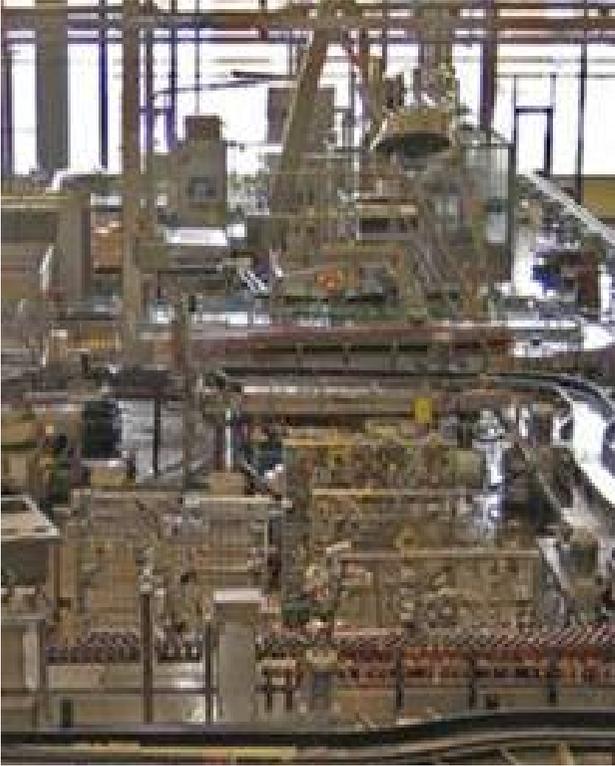
## Trained assessors

- The results for La Buvette indicate that fruit is decreasing in intensity during storage
- For Arrow the intensity of sweetness is decreasing during storage
- It looks like there is a sensory division between 3,6,9 months and 12,15 months

**The results indicate that a BIB is acceptable after 15 months of storage!**

# In the future...

- This project was a new way for us to carry out consumer-tests, and the experience with home-testing was positive.
- The wine was stored at 12°C, which is ideal. At Vinmonopolet and in most home-environments the bag-in-boxes are stored in room-temperature, studies have shown that the development of the wine will go faster at higher temperatures.
- What about other brands, grapevarieties and blends?
- What about white wine?



**THANK YOU!**