EASTMAN

THE NATIONAL FOOD LAB

Taste Testing of Water in Sports Bottles

Sensory Panel Tests Conducted for Eastman Chemical
by The National Food Lab

December 2011

Background

- Copolyesters in general have a reputation for being neutral in taste and aroma for food and beverage packaging.
- Eastman commissioned the National Food Laboratory to compare sports bottles made of various materials, including Tritan™ copolyester.
- Testing was conducted on single designs of commercial bottles made from glass (control), Tritan™ copolyester, stainless steel (SS), polypropylene (PP), and low density polyethylene (LDPE).

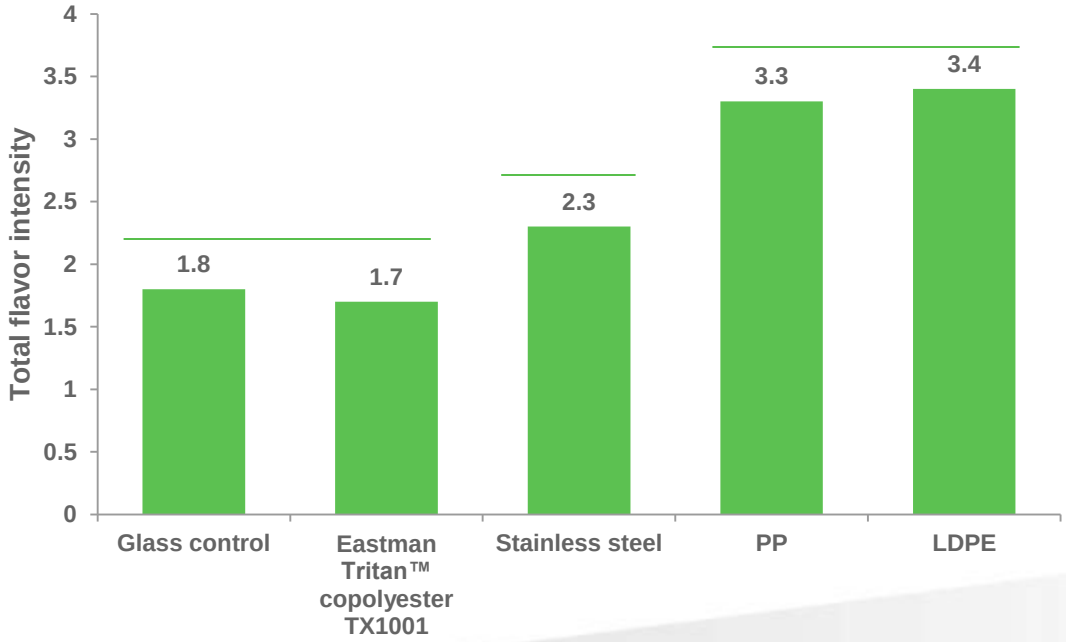
Test Protocol

- Assessed two types of taste effects: Flavor Contribution and Flavor Carryover
- Flavor Contribution
  - Sensory panel taste tests on water stored in fresh bottles.
  - Stored 48 hrs at room temperature and elevated temperature (70F, 110F).
- Flavor Carryover
  - Sensory panel taste tests on water stored in bottles that had previously stored orange juice.
  - OJ: 24 hrs at 110F | rinse | water: 48 hrs at 70F .

Flavor Contribution – Room Temperature Storage

Water stored in bottles for 48 hours at 21°C (70°F)

- The **Eastman Tritan™ copolyester** bottle contributed no more flavor to the water than the **glass control** bottle.
- The **stainless steel** bottle contributed more flavor to the water than the **glass control** and the **Eastman Tritan™ copolyester** bottles.
- The **polypropylene (PP)** and the **low density polyethylene (LDPE)** bottles contributed the most flavor to the water.



Note: Samples that share the same line over the top are not statistically different from each other in intensity.

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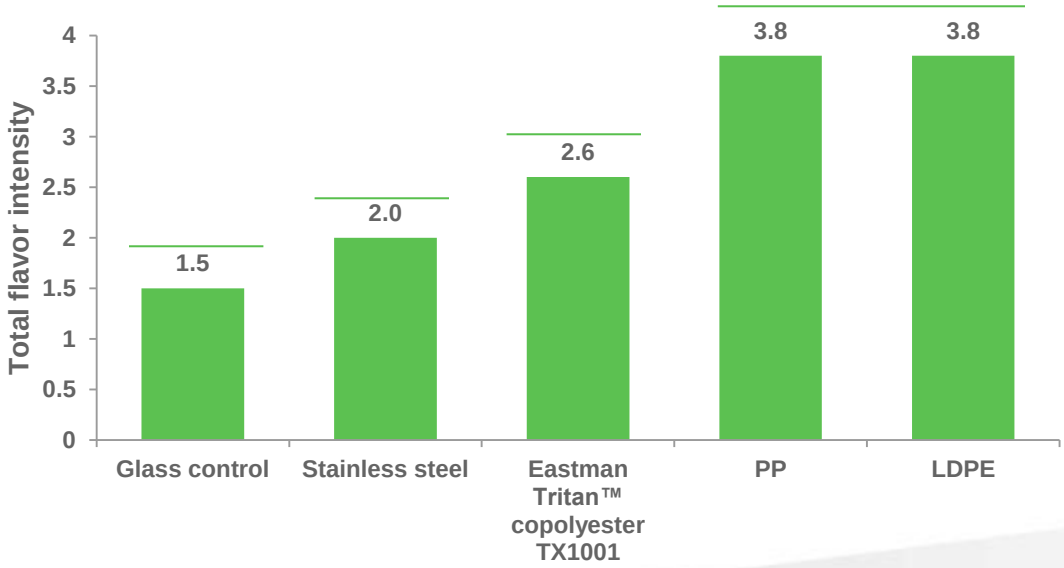
Flavor Contribution – Elevated Temperature Storage

Water stored in bottles for 48 hours at 38°C (110°F)

- The **stainless steel** bottle contributed more flavor to the water than the **glass control** bottle.
- The **Eastman Tritan™ copolyester** bottle contributed more flavor to the water than the **glass control** and the **stainless steel** bottles.
- The **polypropylene (PP)** and the **low density polyethylene (LDPE)** bottles contributed the most flavor to the water.



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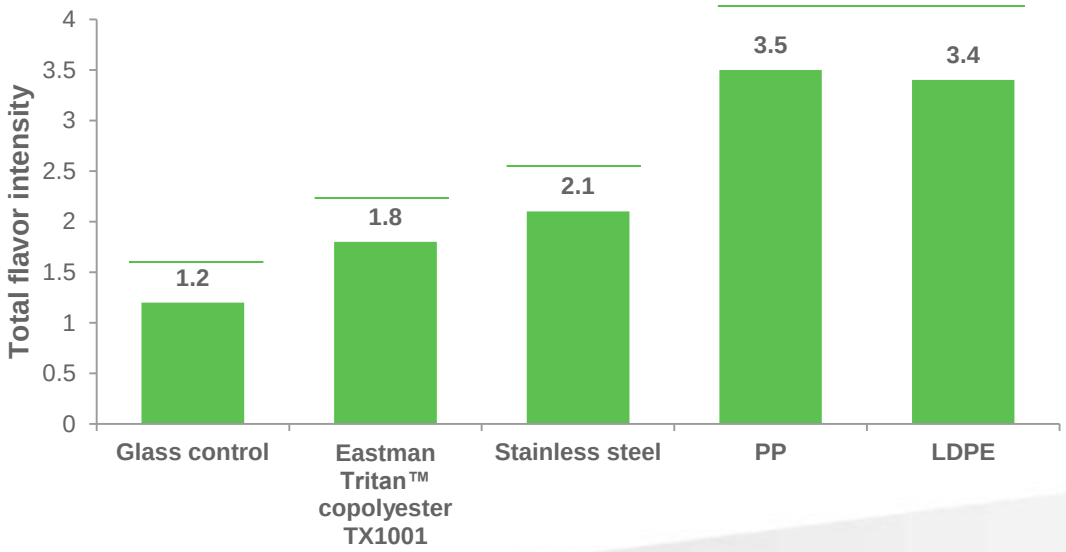
Flavor Carryover

Bottles stored with orange juice, then rinsed and re-filled with water

- The **Eastman Tritan™ copolyester** bottle contributed more flavor to the water than the **glass control** bottle.
- The **stainless steel** bottle contributed more flavor to the water than the **glass control** and the **Eastman Tritan™ copolyester** bottles.
- The **polypropylene (PP)** and the **low density polyethylene (LDPE)** bottles contributed the most flavor to the water.



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Summary of findings

- **Eastman Tritan™ copolyester** samples were virtually taste neutral; that is, showed very little flavor contribution.
- **Eastman Tritan™ copolyester** samples also had lower flavor carryover in the orange juice tests than did the other sports bottle materials.
- **Stainless steel** samples had consistently lower flavor contribution and carryover than did the PP and LDPE samples.
- Overall, the **polypropylene (PP)** and **low density polyethylene (LDPE)** samples did not perform as well as the other bottles. They were highest in flavor contribution and in flavor carryover compared to the three other packages.