

# ORANGE JUICE

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## Contract

The Frozen Concentrated Orange Juice (FCOJ) futures contract trades at the Intercontinental Exchange or shorter the **ICE Futures U.S.**, the former New York Board of Trade (NYBOT). The futures' contract symbol is 'JO' for Juice of Orange.

Contract size is **15.000 lbs** or approximately 7 metric tons with expiries every second month starting from January (January +2).

Price quotation is US cents per lbs which leverages the futures contract to a factor of 15000.

Maximum daily price movement is 10 cents above or below the previous day's settlement price. Subsequent price move allowance is typically expanded to 20 cents.

The FCOJ futures' final settlement is by physical delivery. Origins of deliverables can be the **USA, Brazil, Mexico and Costa Rica**. Delivery points are exclusively at the US East Coast in Florida, Delaware and New Jersey.

Trading hours are only 6 hours from 8am to 2am EST.

## Dependencies

On the supply side, the price for FCOJ is strongly influenced by Florida's weather conditions, i.e. **freezes** during winter and **hurricanes** during summer and autumn. Other threats are fruit diseases like **citrus canker** and **citrus greening**.

On the demand side, price-influencing factors could be changes of consumption preferences due to e.g. a fashionable trend of low-carbohydrate diets such as the Atkins and the low-glycemic diet. Or, price-supporting this time, flu epidemics might temporarily increase consumers' demand in vitamin C-rich food.

Generally speaking, the rising wealth in emerging markets such as in Asia and Eastern Europe boost also citrus fruits demand. Though the per capita orange juice consumption in the US itself trends lower and lower each year.

US orange plants are almost exclusively in **Florida** and California, plus a few in Texas and Arizona. While California grows oranges mainly for eating, above 90% of Florida's harvest goes into juice. The geographic concentration of the orange juice's raw material to just Central and South Florida is one reason for the high volatility in the FCOJ futures prices. Another factor is the relatively subdued liquidity. In fact, the contract's trading volume is one of the lowest of all commodity futures.

During the **hurricane season from June to November** Florida is frequently at risk of losing orange trees or at least of severe damage. A tree might grow up to 15 years to reach maturity. So any loss will affect yields for years to come.

Winter frost is capable to damage citrus crops even more than tropical storms intensifying into hurricanes. That is why acreages in North Florida have been abandoned completely. Many Florida citrus growers therefore (partially) insure their harvest at the beginning of the winter by going long FCOJ futures and sell again after winter passed.

Brazil's potential weather threats are dry weather or even a drought.

Man-made problems can also cause shortage of supply. In January 2012 the FCOJ futures prices reached an all-time high when US authorities denied entry of Brazil imports after traces of a **US banned fungicide** have been discovered. Brazil relied on the chemical Carbendazim to fight the fast-spreading black spot mould disease but would insist its juice contains only a fraction of levels considered harmful. Brazil provided at that time about 11% of the orange juice in the US.

In March the Brazil orange juice and concentrate industry gave in aiming now to deliver Carbendazim-free orange juice by using other far more expensive fungicides as soon as possible. The US Food and Drug Administration (FDA) continues to collect samples and to refuse shipments if tested positively, that is if 10 parts per billion or more of Carbendazim is found.



Chart 1: Daily Front FCOJ Futures Prices since Sep 01<sup>st</sup>, 2009

**Harvest season in Florida is from October to June** the following year. Brazil's production is predominantly in the Sao Paulo area. As such its growing cycle is the opposite to Florida, i.e. it complements the USA, due to hemispheres. Consequently, fresh oranges are available all year-round.

Every year in October the US Department of Agriculture (USDA) makes an initial production estimate for the forthcoming US crop year. Typically an average of experts' estimates front-run that official report. The forecast is in number of boxes, where one box weights 90 lbs or 41 kg.

For the 2012/13 season the USDA expected initially an increase of 5% from last season Florida orange production. Naturally, the FCOJ futures price reacted downwards to the foreseen increased supply. It turned out that 2012/13 production actually decreased by nearly 9%. So much for the reliability and tradability of these official predictions.

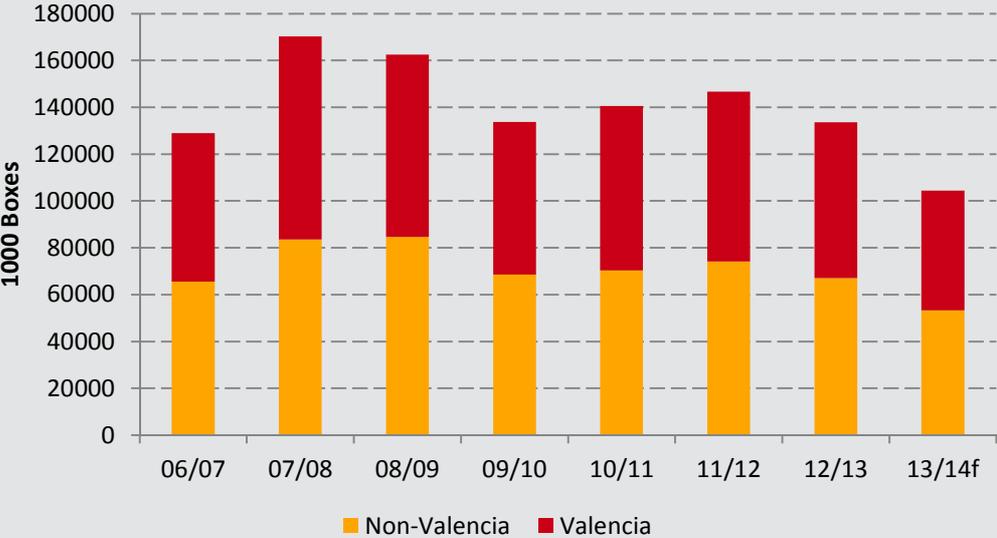


Chart 2: Florida Orange Production including July 2014 Forecast. Source: USDA.

Being long the orange juice futures resembles holding a call option on supply disruption – may it be weather or disease related. In a sense the buyer is long a hurricane or a harsh winter. The US-banned fungicide dispute with Brazil was something on top of an already seemingly unpredictable market forcing prices involuntarily to historical highs. Often initial expectations and fears would later not match the actual damage and exaggerated prices correct subsequently.

## Main Exporters

By a decisive margin Brazil is the main orange grower, followed by the USA (mainly Florida), China and the EU (mainly Spain). The USA and the EU are also the most important consumer countries and regions, while Brazil uses more than 90% of its oranges for export. The world's leading orange juice exporters are therefore **Brazil**, the **USA** and **Mexico**. Source: USDA.

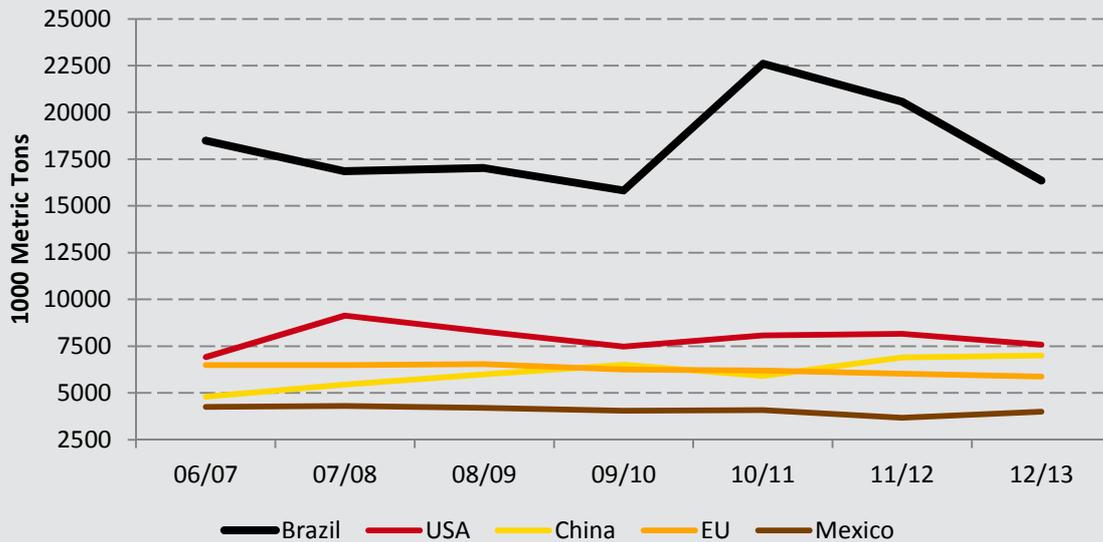


Chart 3: Largest Orange Production Countries

## Main Importers

The **EU** is the largest orange juice importer, followed by the **USA**. Source: USDA.

## Main Varieties and their Harvest Periods

Early in the Florida season, from October to January, the **Navel** orange is harvested. It is characterized by a second fruit at the apex resembling a navel. This orange variety has a thicker skin making it primarily suitable for direct human consumption.

The **Hamlin** orange is the principle early-season juice orange and is harvested in Florida from October to March.

By sheer volume, the **Valencia** orange is the dominant variety in Florida (see chart 2). But it is at the same time a late season fruit being picked from February to June. The Valencia is ideal for juice extraction.

## The Making of FCOJ

Oranges and its juice are perishable. Unlike bananas, oranges do not ripen after being removed from the tree. But a deliverable futures contract needs to be based on something readily storable and easy-to-ship. The process for making FCOJ was developed at the University of Florida in 1948:

Freshly squeezed orange juice is filtered from pulp. Most of the water is then extracted by vacuum and heat (pasteurized). Essences and oils are also stripped out during that process and will be added back later when the concentrate is reconstituted. The concentrate, now mainly sugar, is kept cool and stored at minus 12 degrees Celsius.

Nowadays, FCOJ does not hold the main market share anymore after not-from-concentrate (NFC) took over. But it still remains the industry's price benchmark.

## Useful Links

- ICE Futures U.S., FCOJ Futures:  
<https://www.theice.com/productguide/ProductSpec.shtml?specId=30>
- United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS), Florida, Citrus:  
[http://www.nass.usda.gov/Statistics\\_by\\_State/Florida/Publications/Citrus/index.asp](http://www.nass.usda.gov/Statistics_by_State/Florida/Publications/Citrus/index.asp)
- US Environmental Protection Agency, Carbendazim in orange juice  
<http://www.epa.gov/pesticides/factsheets/chemicals/carbendazim-fs.htm>
- The Story of Florida Orange Juice  
[http://www.ultimatecitrus.com/Story/oj\\_story.html](http://www.ultimatecitrus.com/Story/oj_story.html)
- Index mundi orange juice export data  
<http://www.indexmundi.com/agriculture/?commodity=orange-juice&graph=exports>

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