

Antioxidant capacity and cellular protection by the West African sorghum-based product

JOBELYN™

Jobelyn™ is produced from a unique variety of Sorghum bicolor, recently domesticated from a West African wild variety, representing original genetic makeup and not a result of intense breeding efforts. **Jobelyn™** is an extract derived specifically from the intensely colored leaf sheathes. **Jobelyn™** is GRAS-certified by the FDA. **Jobelyn™** has an unusual chemical profile compared to other variants of Sorghum bicolor. It has a very high content of unique antioxidant polyphenols, including unique dimeric 3-deoxy-anthocyanidins. These compounds contribute to the chemical and biological antioxidant effects.

Sorghum bicolor is a species of grass, traditionally cultivated for its nutritious grain. Sorghum is now grown in many tropical and subtropical regions of the world, and is gaining increased popularity as a non-gluten grain. Historical uses of Sorghum include food, hot teas, beers, and traditional medicinal extracts.

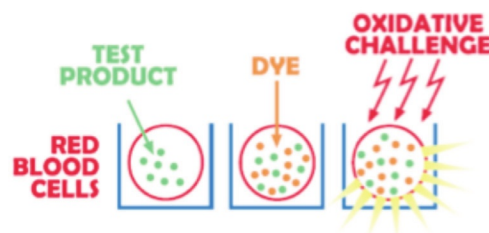
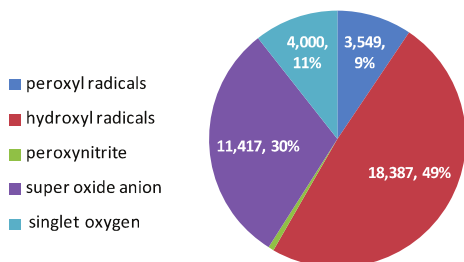
Health benefits include:

- Multi-faceted anti-inflammatory properties
- Immune activation
- Hematopoietic effects
- Pain reduction

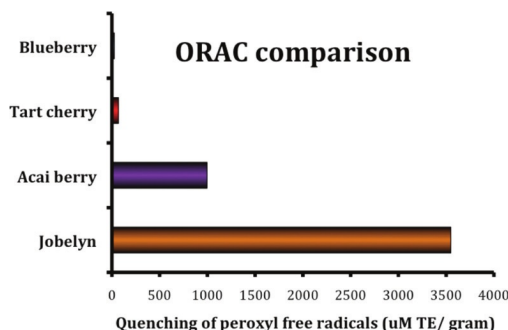
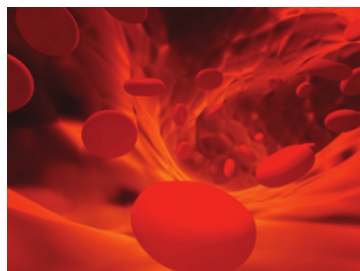
Oxygen is essential for our life. However, oxygen is used in chemical reactions in our body to produce free radicals, which are harmful, electrically charged ions. Antioxidants are compounds capable of neutralizing free radicals that would otherwise potentially damage cells and tissues. Antioxidants help to prevent damage to cells and tissue, and provide multi-faceted health benefits.

There are different methods to test for antioxidants. Each method provides different information. For this reason, a sequential testing strategy was used.

The Oxygen Radical Absorbance Capacity or 'ORAC' test, is a widely used antioxidant test. It measures chemical antioxidant capacity, and was used to test **Jobelyn™**.



While the ORAC test helps demonstrate whether a product contains chemicals that are able to perform antioxidant reactions, it does not tell us if compounds are functioning as protective antioxidants in biological systems. Because of this limitation of the ORAC test, the Cellular Antioxidant Protection in erythrocytes, or CAP-e, test was also used to test **Jobelyn™**. The CAP-e test directly measures antioxidant uptake and protection at the cellular level.



DEFINITIONS

Free radical:

An atom or group of atoms with at least one unpaired electron. Unpaired electrons are highly reactive and can damage living cells.

Antioxidant:

A compound capable of donating an electron and thus neutralizing the electrical charge that may otherwise lead to cascading cellular damage.

Jobelyn™ showed cellular antioxidant protection capacity in the CAP-e test. The cellular protection seen in the CAP-e assay allows us to conclude that **Jobelyn™** contains antioxidants that are bioavailable and functional at the cellular level. Protection was seen both in the water extract and in the ethanol extract. This suggests a complex range of biologically active antioxidants in **Jobelyn™**.