



## GEORGIA PECAN COMMISSION

### New Mexico State University Study — Pecan

In 2012, New Mexico State University researchers conducted a feasibility study of locating and operating a pecan processing facility in southern New Mexico that would produce high-grade pecan oil and de-fatted gluten-free pecan flour. As part of the feasibility study, blind taste tests of oil and flour were conducted using a new extraction process developed by Oklahoma State University and Ambient Temperature Extraction Partners of Oklahoma. The OSU process uses propane and leaves behind oil that does not have to be filtered, and de-fatted flour that won't turn rancid. This method is cost-efficient because it removes nearly 100% of the oil, resulting in two products: pure oil and a dry, defatted flour product.

The oil produced with the OSU method is low in saturated fats and high in heart-healthy unsaturated fatty acids. The flour is gluten-free.

William Gorman, a professor emeritus in NMSU's College of Agricultural, Consumer and Environmental Sciences, and his team of researchers see great potential for such a pecan oil and flour.

#### Pecan Oil Taste Test

Taste testers compared pecan oil made from roasted and non-roasted pecans with olive oil.

According to the study, saturated fats are considered the "bad" fats that tend to raise levels of LDL (bad) cholesterol, while monounsaturated and polyunsaturated are "good" fats that help reduce LDL cholesterol while raising HDL (good) cholesterol:

"All the fatty acids are important in a healthful diet (American Heart Association, 2011). It is imperative that these three fatty acids be consumed in balance in order to be most beneficial ... pecan oil is the most balanced oil, with sufficient amounts of all fatty acids as well as a high amount of vitamin E. Vitamin E provides many health benefits, chief among which are anti-inflammatory properties that alleviate and prevent degenerative diseases."

#### Comparison of Oil Benefits

| Attributes (serving size 1 Tbsp)     | Pecan Oil <sup>a</sup> | Virgin Olive Oil <sup>b</sup> | Grapeseed Oil <sup>b</sup> | Walnut Oil <sup>b</sup> |
|--------------------------------------|------------------------|-------------------------------|----------------------------|-------------------------|
| Calories per serving                 | 126                    | 120                           | 119                        | 119                     |
| Saturated fats                       | 8.37%                  | 13.81%                        | 9.63%                      | 9.1%                    |
| Monounsaturated fats (Omega-9)       | 58.25%                 | 72.96%                        | 16.30%                     | 22.8%                   |
| Polyunsaturated fatsa (Omega-3 & -6) | 32.94%                 | 10.52%                        | 69.63%                     | 63.3%                   |
| Omega-3                              | 1.28%                  | 0.76%                         | 0%                         | 10.4%                   |
| Omega-6                              | 31.65%                 | 9.76%                         | 69.59%                     | 52.9%                   |
| Vitamin E (gamma-Tocopherol)         | 31.03 mg               | 12 mg                         | 3.9 mg                     | 0 mg                    |

Sources: <sup>a</sup>Silliker Labs, 2010; <sup>b</sup>USDA-ARS, 2011



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#### Comparison of Flour Benefits

| Attributes (serving size 36 g) | Pecan Flour <sup>a</sup> | Rice Flour <sup>b</sup> |
|--------------------------------|--------------------------|-------------------------|
| Calories per serving           | 115                      | 135                     |
| Protein per serving            | 15 g                     | 2 g                     |
| Carbohydrates per serving      | 13 g                     | 29 g                    |
| Dietary fiber                  | 7 g                      | 1 g                     |
| Fiber % daily value            | 28%                      | 4%                      |
| Iron % daily value             | 20%                      | 0%                      |
| Calcium % daily value          | 6%                       | 0%                      |
| 100% gluten-free               | yes                      | yes                     |

Sources: <sup>a</sup>Silliker Labs, 2010; <sup>b</sup>USDA-ARS, 2011

#### Results

- › Out of 41 participants in the blind taste testing, 31 indicated they preferred the taste of pecan oil over olive oil.
- › Consumers also reacted favorably to the health benefits of the pecan oil and flour. After participants were given nutritional information for both pecan and olive oil, eight out of the 10 who had previously chosen olive oil changed their preference to pecan oil, **demonstrating that nutritional information can influence consumer decisions.**
- › One of the main concerns of gluten-intolerant consumers in the test is the difficulty of finding a tasty flour substitute that mimics the consistency of wheat flour. Ten out of the 41 participants followed a gluten-free lifestyle; they indicated that the three products made with pecan flour were exceptionally better in texture and taste than those made from other gluten-free flours they currently use or have tried.