plesse was GRAS. The Flavor Extracts Manufacturers Association (FEMA), for example, also has an expert panel to determine the GRAS status of artificial flavors made from natural products.

But Gerard McCowin, director of FDA's division of food and color additives, says the FEMA situation is different because it deals with minute amounts, compared with the potentially large Simplesse market.

Although NutraSweet, a division of the St. Louis-based Monsanto Co., has done nothing illegal, some believe the company made a public relations blunder. "It is not a legal question, but it is an issue of good regulatory sense," says Richard Merrill, chief counsel at FDA from 1975 to 1977.

"If you want to market a blockbuster product, then you better tell the regulatory agency that gets paid by the American public," says Merrill, now dean of the University of Virginia Law School in Charlottesville.

A spokeswoman for NutraSweet told SCIENCE NEWS the company went through proper legal channels, and would not comment further on the Simplesse issue. According to FDA Deputy Commissioner John A. Norris, company officials told him the whole thing was "a miscalculation on their part."

Some people believe NutraSweet officials may have wanted to avoid a long FDA review process and that they wanted to get a jump on their competition, namely Procter and Gamble's fat substitute Olestra, which is derived from sugar and edible oils and which FDA has been reviewing since June. Unlike Simplesse, Olestra has no calories, is not metabolized and can be used for cooking.

Simplesse, however, still would have broad applications. It can be used in dairy products and in oil-based products, such as salad dressings, mayonnaise and margarine, and it has 1.3 calories per gram, compared with fat's 9 calories per gram. Four ounces of traditional ice cream, for example, contains 283 calories while the same amount of Simplesse ice cream would contain 130 calories.

To simulate fat, NutraSweet scientists used a patented heating and blending process that shapes milk or egg protein into tiny round particles that roll over the tongue, creating a smooth and creamy sensation.

Once NutraSweet submits a GRAS petition, FDA's review process should take about 12 to 18 months, Norris says, which would coincide with NutraSweet's marketing goal. — *S. Eisenberg*

Priming for a lucky strike

Mersenne primes hold a special place in the never-ending pursuit of larger and larger prime numbers — numbers divisible only by themselves and 1. Expressed in the form $2^p - 1$, where the exponent p itself is a prime number, Mersenne numbers have a structure that makes it relatively easy to check whether even enormous numbers truly can't be factored. The largest prime yet found — the 30th Mersenne prime — has 65,050 digits when $p = 216{,}091$ (SN: 9/28/85, p.199).

This week, two computer experts found the 31st Mersenne prime. But to their surprise, the newly discovered prime number falls between two previously known Mersenne primes. It occurs when $p = 110{,}503$, making it the third-largest Mersenne prime known.

"To tell the truth," says Walter N. Colquitt of the Houston Area Research Center in The Woodlands, Tex., "I didn't expect to find anything." Colquitt, working with computer consultant Luther Welsh Jr. of El Toro, Calif., had written a computer program and organized a systematic search of Mersenne numbers in the hope of finding a record-breaking prime.

This time, because he had only a limited amount of time available on an NEC SX-2 supercomputer, Colquitt decided to run some smaller candidates to be sure that nothing had been missed in previous searches. Only Mersenne numbers with exponents up to 103,000 had been exhaustively searched in the past, says Colquitt. Later efforts had been "shotgun" affairs that covered only narrow ranges of large numbers. The new Mersenne prime falls within one of the gaps.

The supercomputer, running a program written completely in FORTRAN, took only about 11 minutes to confirm that $2^{110{,}503} - 1$ is a prime number. "That's an incredibly fast time," says David Slowinski, formerly with Cray Research, Inc., in Minneapolis and now a student at Carnegie-Mellon University in Pittsburgh. "They [must] have some very good trick to get such a fast time." Slowinski himself has discovered several Mersenne primes and plans to check Colquitt and Welsh's result.

"We tried different multiplication algorithms," says Welsh. "The program, as it stands now, is fairly decent, although it's not as fast as it could be."

"If you're going to look for prime numbers," says Colquitt, "you're probably going to learn more about multiplication than you want to know. You also have to be systematic — and you have to be lucky and pray a little bit."

Are there more Mersenne primes lurking in the gaps? "I have absolutely no idea," says Colquitt. "Thousands of them are untested yet." — *I. Peterson*

Good-deed viruses stop mouse diabetes

Apparently not all viral infections are bad news. A California researcher reported last week that injecting a specific virus into mice predisposed to diabetes seems to prevent the disease. Using nonobese diabetic mice and the lymphocytic choriomeningitis virus (LCMV), Michael B.A. Oldstone of the Research Institute of Scripps Clinic in La Jolla found that the virus interacts with certain immune cells to stop the destruction of insulin-producing cells in the mice.

Because of autoimmune reactions against their own pancreatic cells, nonobese diabetic mice develop life-threatening diabetes, usually by the age of 6 months. Prompted by his earlier findings that viruses may alter the autoimmune response, Oldstone injected mice with LCMV, which can infect a range of animals that includes humans. Of the mice injected when newborn, none developed diabetes within 9 months. Of those injected at age 6 weeks, only 6 percent became diabetic within the same period of time, compared with 95 percent of the untreated mice. About 20 mice were in each of the three treatment groups.

Oldstone writes in the Jan. 29 SCIENCE that probably only a small subset of cells is involved in this type of diabetes and that the animal's immune system is still generally intact. He says evidence suggests that the helper T lymphocytes are the culprits, and that they are incapacitated by LCMV through an undetermined mechanism. "We presume the virus gets into a small subset of these helper cells. . .and the virus alters their function or kills them," Oldstone said in an interview.

Although the virus causes chronic infection in mice, its injurious effects on the animals are "subtle and minimal," says Oldstone. Emphasizing that he does not advocate injecting whole viruses as potential therapy, Oldstone says he is searching for a component of the virus that can give the same protection, with possible applications as a treatment for human diabetics.

Aldo A. Rossini, from the University of Massachusetts Medical Center in Worcester, told SCIENCE NEWS that the new results are "an exciting observation. But one has to be very cautious . . . there are a lot more studies that have to be done." Nevertheless, Rossini says the new research direction taken by the La Jolla study could have significant implications for diabetes. "For a long time, it's been suggested that a virus plays a role in the pathogenesis of diabetes," he says. "Now, all of a sudden, we're saying a virus is important in *protection* from diabetes, that there are good viruses and bad viruses." — *D.D. Edwards*