Food Science

Janet Raloff reports on the annual meeting of the American Dietetic Association in Kansas City, Mo.

More than a taste of alcohol

Recipes frequently call for flavoring dishes with wine or other alcoholic spirits – often as a replacement for heavy creams and starches in "nouvelle" or light cuisine. Don't worry about inebriating your dinner guests or adding "empty" calories, cooks are told; virtually all of the alcohol volatilizes during food preparation. While that may sound plausible, new research shows that up to 85 percent of the alcohol used in cooking may end up in the finished entree.

Though simmering a pot roast at 185°F for 2½ hours removed 95 percent of the red wine added, 25 minutes of baking at 375°F retained 45 percent of the dry sherry in scalloped oysters. Because brandy alexander pie involves no cooking, the researchers were hardly surprised to find that 75 percent of its alcohol ended up on the dessert plate. But when 75 percent of the alcohol survived flaming for 48 seconds in cherries jubilee, study leader Evelyn A. Augustin of Washington State University in Pullman was so surprised that she repeated the experiment several times – with no change in results. And what makes Grand Marnier sauce taste so heady? Some 85 percent of the alcohol in its liqueur survives blending with a boiling mixture of sugar, cornstarch and orange juice.

High-fat diets that lower cholesterol

Even people at risk of heart disease achieved major changes in blood fats – including reductions in total serum cholesterol – while maintaining a tasty, high-fat diet. The trick, say researchers from Ohio State University at Columbus, is limiting saturated fats to less than 8 percent of total calories.

Nutritionist Jean T. Snook and her co-workers studied changes in the blood lipid profiles of 20 men, aged 27 to 47, who slowly cycled through four diets, each deriving 40 percent of its calories from fat. The researchers fed the men a typical U.S. diet – high in butter and saturated fats – for two weeks, then switched them to a vegetable-oil-dominated diet for the next five weeks. After a seven-week, Thanksgiving-to-New Year's reprieve from the supervised, cafeteria-supplied meals, the men returned for phase two of the trials: another two-week butter diet, followed by five weeks on a different vegetable-oil-dominated menu.

In the butter diet, 21 percent of each day's calories came from saturated fat. The corn oil diet delivered 19 percent of its calories as polyunsaturated fats, and the sunflower oil menu derived 28 percent of its calories from monounsaturated fats. In all diets except the corn oil regimen, polyunsaturated fats represented less than 7 percent of calories. Similarly, except on the butter diet, saturated fats were limited to less than 8 percent of calories. Both limits match guidelines recommended in the National Research Council's landmark "Diet and Health" report (SN: 4/22/89, p.250).

When the men switched from the butter diet to either of those dominated by vegetable oils, their total serum cholesterol plummeted 16 to 21 percent from a starting average of 240 milligrams per deciliter of blood. Low-density lipoprotein (LDL) cholesterol dropped 21 to 26 percent, and triglycerides fell 10 to 21 percent. Since high-density lipoprotein (HDL) cholesterol values did not change, the ratio of total cholesterol to HDL cholesterol – a highly predictive risk factor in heart disease (SN: 9/9/89, p.171) – actually improved by at least 20 percent in these men. (Scientists think high-density lipoproteins help remove cholesterol from the blood.) And in a separate experiment, adding 300 mg of cholesterol to the vegetable oil diets – for a total intake of 480 mg cholesteral daily – "basically had no effect" on these serum cholesterol changes.

"Diet modifications designed to lower serum lipids could place most of the emphasis on reducing saturated fats rather than total fat intake," Snook and her co-workers conclude.

Paleontology

Richard Monastersky reports from Austin, Tex., at the annual meeting of the Society of Vertebrate Paleontology

Standing pterosaurs on two feet

More than 200 million years ago, long before the appearance of birds, a group of flying reptiles called pterosaurs dominated the skies. Their life on the ground, however, was a different story. Paleontologists have long believed that pterosaurs, including the ferocious-looking pterodactyl, were ungainly walkers, sprawling about on all four limbs like a bat. New evidence supports a more recent theory, which holds that pterosaurs were not so clumsy on land.

In 1983, Kevin Padian of the University of California, Berkeley, broke ranks with other researchers when he proposed pterosaurs were not quadrupedal but bipedal, walking on two feet. Yet tradition dies slowly. Some paleontologists argue against bipedality by maintaining that pterosaur pelvises would cause the hind legs to stick out, forcing the animal to sprawl on all fours.

Which image is correct? The proof is in the pelvis, says Christopher S. Bennett of the University of Kansas in Lawrence. Bennett suggests that all previous arguments against bipedal pterosaurs rest on a few fossil pelvises of questionable quality. To find more clues, Bennett reconstructed a better-preserved pelvis from Brazil. This fossil clearly shows, he says, that pterosaurs' hind limbs could have extended straight down from their bodies, allowing them to walk upright on two feet. Bennett and others believe the reptiles could even run for short bursts to gather speed for a liftoff.

A nose for combat

Sometimes injuries and disease can prove helpful, especially when they offer researchers a glimpse into the lifestyle of a long-extinct animal. Take the mosasaur, a giant aquatic lizard from the dinosaur era. While studying about four dozen mosasaur jaws and skulls, a pair of paleontologists noticed a pattern of injuries. Gordon L. Bell Jr. of the University of Texas at Austin and James Lamb of the Red Mountain Museum in Birmingham, Ala., found that about half the specimens showed evidence of healed gash wounds on their snouts. In some cases, specimens sported several regularly spaced wounds running in a line along the outside of the jaw.

Though initially puzzled, Bell and Lamb now offer a theory to explain the wounds. They suggest mosasaurs sometimes grappled each other's noses, much as some modern alligators and lizards do. Observers have noticed that alligators in a confrontation will sometimes lock snouts and twist about, Bell says.

He and Lamb propose this same style of combat could explain the grooved wounds along the mosasaur jaws. Because the long, thin animals would have attacked head-on, most battles would have sent both individuals spinning and so would have rarely proved deadly – a concept that would explain why so many mosasaurs show evidence of nonfatal wounds. The researchers plan to check their hypothesis by looking at other collections of mosasaur fossils. If the animals did indeed grapple, that behavior suggests they were much more territorial than previously suspected, Bell says.

Social sabertooth survivors

Injuries and disease have also revealed important clues about the behavior of a type of sabertooth cat known as *Smilodon*, reports Fred P. Heald. A retired physician, Heald now works at the George C. Page Museum in Los Angeles, where he has studied thousands of pathologic *Smilodon* fossils discovered in asphalt seeps at Rancho La Brea. The fossils reveal that many of these cats survived severely disabling wounds and illnesses. Heald says this indicates *Smilodon* lived in groups and provided some care for sick members, unlike the solitary cheetah, which cannot survive if severely hurt.