

Biomedicine

Andrea Rowand reports from the Conference on Aging, Reproduction and the Climacteric held at the National Institutes of Health in Bethesda, Md.

Sperm change little with age

Of nearly 600,000 children born in West Germany in 1982, birth records show 148 of the infants had fathers over 61 years old; 18 were fathered by men aged 71 or older.

"These [figures] were met with skepticism," notes Eberhard Nieschlag of the Max Planck Clinical Research Unit for Reproductive Health in Muenster. But no snickers are called for, he says, as male reproductive capacity doesn't necessarily decline with age. Nieschlag conducted a three-year study on the reproductive abilities of grandfathers, comparing sexual activities, sperm and semen analyses for 23 grandfathers and 23 young fathers.

"There were no changes, only subtle differences. Sperm function stays perfectly normal, even at the highest age," Nieschlag says. Differences in his "vigorous" group of grandfathers include slightly less sexual activity, "significantly" less sperm motility and lower semen fructose levels, he says. But semen volume, sperm counts and morphology, semen acidity, and the ability of sperm to penetrate hamster ova were about the same in both groups of men, he says. But this year, coincidentally, many of his older subjects suddenly succumbed to various ailments and their potency and reproductive functions also declined, he adds. This suggests that disease or illness, not old age per se, are the predictors of infertility and impotence, Nieschlag says.

Older moms are nothing new

Fears of rising infertility and predictions of a first-baby boom among older mothers are more media hype than anything else, says Jane Menken of Princeton University in New Jersey.

"There's evidence that the decline in fertility is modest," says Menken, who recently surveyed fertility and birth rates in some U.S. and European locations. For one thing, fertility rates are hard to assess, as women's use of birth control "contaminates" data, she says.

Menken finds that the so-called new wave of women putting off the birth of a first child is hardly novel, but is instead a return to pre-World War II trends. For hundreds of years, European women delayed births by delaying marriages until their late 20s or 30s, she says. And a study of British birth records from 1550 to 1849 found many of these women were successful in attempts for a first child within five years of marriage. Basing infertility on the 12-month period of "no conception" may result in misleadingly high rates, she says. This could be why data show rising infertility for black women. In 1965, 3 percent of married black women between ages 20 and 24 not using contraception were labeled infertile for not conceiving a child within 12 months. That figure rose to 15 percent by 1976, but could be overestimated because a too-short 12-month time frame is used, Menken says.

Hormone peaks level off with age

Whether lower levels of testosterone — the main androgen hormone, responsible for secondary male sexual characteristics — are normal in aging men has been controversial and unclear, says William Bremner of the University of Washington in Seattle. This steroid hormone is produced in the adrenal cortex and testes, and it's known that the number of Leydig cells (testis cells thought to produce androgens) falls as men age, he says. Past studies found testosterone lower in some older men, but not others. Bremner's study finds that it may not be so much the level of this hormone that changes as it is that normal daily fluctuations even out as men age. He finds that young men's testosterone levels peak in the morning, with evening lows, while for older men, there's little cyclic change in serum testosterone. Hormone levels for both groups were no different during the younger men's 12-hour evening lows, Bremner says, concluding that lower and acyclic testosterone is normal in aging men.

Food Science

In search of no-calorie cooking 'fat'

Those who crave fried, buttery or oily foods would love a non-caloric alternative to the high-calorie heart-stopping fats and oils that make these treats possible today. Donald Hamm of Best Foods in Union, N.J., investigated five promising candidates. Alas, a report of his results in the March-April JOURNAL OF FOOD SCIENCE, which starts out encouragingly, ends with a negative conclusion. On the positive side, four not only resisted digestion completely — and if they aren't digested, they don't contribute calories — but also had physical properties generally comparable to corn oil, suggesting their suitability for use in margarine, baking, mayonnaise or as a table oil. However, consumed at high levels they act like mineral oil — as a strong laxative. Data suggest the fifth candidate — jojoba oil — would be 20 to 40 percent digestible (and therefore caloric) and degrade into long-chain alcohols, another potentially serious problem.

Crusty proteins are hard to digest

Recipes usually instruct you to bake breads until crusts are just browned, or cookies and piecrusts until they are tinged with gold. What makes those foods darken is a bit of complex chemistry known as the Maillard or "browning" reaction. And while browning often imparts a desirable flavor, it also lowers the nutritional value of the proteins involved. A study by Barbara Schneeman and George Dunaif from the University of California at Davis in the May-June JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY outlines how browning affects digestion.

For four weeks, the sole dietary protein they fed rats was non-fat dry milk. Some got unheated milk, others milk heated at 121°C until it became either a light brown (30 minutes) or cocoa brown (45 minutes). Animals on the unheated-milk diet grew and gained weight, while those on the "mildly" heated milk registered no weight gain and those on the severely browned protein cut their food intake and lost weight.

Not only did eating browned proteins delay stomach emptying, but it also increased the protein content of materials that had passed from the stomach to the intestinal tract — something the researchers attribute to "the poor digestibility and absorption of the dietary protein." Nor was reduced digestion from lack of trying. Schneeman points out the animals fed browned milk secreted more protein-degrading enzymes, possibly "indicative of the animals' trying to digest this protein and not being very successful." Moreover, she notes, many of these excess enzymes never underwent the normal autodegradation. Because enzymes are proteins, she says, this reduced autodegradation contributed to the animals' overall protein deficit.

Milk allergens

Allergy to cows' milk has been estimated to affect up to 8 percent of all children. Japanese chemists from the University of Tokyo teamed up with pediatrics specialists at Tokyo's Doai Memorial Hospital to identify the agent involved.

They isolated compounds able to evoke allergic reactions from two sources of the milk-sugar lactose: "ALG 1" was separated from a commercial, reagent grade of lactose, "ALG 2" from a lactose used in infant formula. Each was then subdivided into four fractions. Not only were the sugar-to-protein ratio and amino-acid makeup of the eight fractions different, but so also was their ability to induce skin reactions in individuals with diagnosed milk allergies. Only one of the four compounds isolated from ALG 1 was clearly reactive, but so potent was its effect that the authors write in the March-April JOURNAL OF FOOD SCIENCE that they believe "this fraction contained the milk allergen" they sought. By contrast, all four of ALG 2's fractions evoked reactions in some exposed individuals, though most patients did not react to all of them.