

the effects of food restriction on age-related physiological changes," says Masoro, a physiologist. Now, Masoro and his colleagues report that several key factors may be involved in the life-lengthening properties of calorie-restrictive diets.

In a study of 520 male rats, the researchers found that the sub-group placed on low-calorie diets far outlived those permitted to eat freely — 95 percent of the food-restricted animals lived beyond the median age of the free-eaters.

Beyond that, however, Masoro reports distinct physiological differences between the two groups. As an animal ages, it becomes less responsive to the hormones glucagon and adrenalin, which promote fat metabolism by releasing fat from adipocytes (fat cells). In the rats whose caloric intake was restricted from early life, however, this hormone responsiveness decline — which could lead to obesity — was significantly delayed, Masoro reported in a paper presented at the recent meeting of the American Association for the Advancement of Science.

In addition, he reports that the bloodstream's accumulation of serum lipids, which increases with age, is also delayed in early food-limited rats. Finally, Masoro and his group found that the dietarily restricted rats developed fewer and smaller fat cells in tissue surrounding the kidneys than did their nonrestricted counterparts. The results suggest that, contrary to much widely held belief, the lifelong number of fat cells is not determined only by preweaning nutrition in the first few weeks of life but is also influenced by dietary restrictions after that.

The findings indicate that "one mechanism by which food restriction increases the length of life of rats relates to the delay in the time of onset and a change in the chronologic course of age-related physiologic decline," Masoro says. "... it can be theorized that by delaying physiologic decline, food restriction delays the onset of [age-related] diseases, thus prolonging life." □

HEAO-1 runs out of gas

After operating for nearly three times its intended six-month lifetime, the HEAO-1 satellite, first in NASA's High Energy Astronomy Observatory series, finally ran out of gas in its attitude-control system on Jan. 9. Since its Aug. 12, 1977, launching, the device had approximately quadrupled the list of known celestial X-ray sources (from about 350 to almost 1,500), as well as discovered a new possible black-hole candidate and evidence for a widespread hot plasma possibly indicating the cyclic, or "closed" nature of the currently expanding universe. A second HEAO, launched Nov. 13, 1978, is still operating, and HEAO-3 is scheduled for a September liftoff. HEAO-1 is expected to burn up during atmospheric reentry in late March. □

Reactor-safety study discredited by NRC

In a statement issued Jan. 19, the Nuclear Regulatory Commission renounced its previous endorsement of a five-year-old reactor-safety study known alternately as WASH-1400 and the Rasmussen Report. NRC's statement follows a technical, and in places severely critical, reevaluation of the study by a panel it commissioned in 1977.

"Despite its shortcomings, WASH-1400 provides at this time the most complete single picture of accident probabilities associated with nuclear reactors," the panel said. While praising the study's general methodology and recognizing its contribution to assessing the risks of nuclear power, however, the review panel leveled serious criticism.

For example, the panel said it was unable to determine whether absolute probabilities of accident sequences were high or low, but that error bounds on those estimates were in general understated. The reason, it said, was partly due to many cases being based on inadequate data, partly due to an inability to quantify common-cause failures, and partly due to some questionable methodological and statistical procedures.

The panel questioned the peer-review process, which it said in places failed to acknowledge or merely evaded cogent comments from critics. And WASH-1400's lack of clarity made it difficult to trace a line of thought throughout the study, thereby crippling many efforts to accomplish responsible peer review.

The executive summary — the only section understandable to most laymen — was a poor description of the larger tome, the panel said, because it did not indicate the full extent of the consequences of reactor accidents nor sufficiently emphasize the uncertainties involved in achieving probability calculations.

As a result, NRC said it "withdraws any explicit or implicit past endorsement of the executive summary"; agrees the peer-review process was "inadequate"; and accepts the panel's conclusion that absolute values of risks "should not be used uncritically either in the regulatory process or for public-policy purposes." In particular, NRC said it "does not regard as reliable the report's numerical estimate of the overall risk of reactor accident." Where possible, however, NRC will continue to use parts of the study that are based on adequate data and verified analytical techniques.

Morris K. Udall (D-Ariz.), who chairs the House Interior subcommittee with oversight of nuclear regulation, announced he will hold hearings on the study. "Nuclear proponents have for years used the study to assure the public that nuclear power is safe. [NRC] has now made clear that the report is useless for this purpose," Udall

said. "[Its WASH-1400] statement is a hopeful sign that the NRC is becoming the objective regulator that Congress had sought." NRC credits Udall's criticisms of WASH-1400 with its call for a reevaluation of it. □

Smoking imperils the unborn

The Surgeon General reported, on the basis of 30,000 scientific articles, that there is "overwhelming evidence connecting cigarette smoking with disabling and fatal diseases" (SN: 1/20/79, p. 39). Now still more damaging evidence against cigarette smoking has emerged — evidence so new that it couldn't be included in the Surgeon General's report. It is that maternal cigarette smoking can imperil the health of unborn and newborn children — even if women quit smoking before becoming pregnant.

The indictment comes from the U.S. Collaborative Perinatal Project, headed by Richard L. Naeye of Pennsylvania State University Medical Center. It was released last week at the American Heart Association's annual science writers' forum and was based on the results of a study of more than 50,000 pregnancies at 12 U.S. medical centers. The study results are essentially the following ...

- Cigarette smoking during pregnancy significantly increases the risk of miscarriages, especially by causing a premature separation of the placenta from the womb, by causing Rh blood disease or by contributing to malformation of the fetal heart or other organs.

- Cigarette smoking during pregnancy strongly increases the risk of fetal birth defects that are usually fatal.

- Cigarette smoking during pregnancy increases the chance of a newborn dying from crib death, although smoking is not the major risk factor in such deaths.

- Even if a woman gives up cigarette smoking before becoming pregnant, her previous smoking increases the risk of placenta praevia, a condition in which the placenta is attached abnormally low in the womb and that leads to dangerous complications during labor and birth. □

Fish lives, dam dies

The verdict is in and the snail darter wins. The new Cabinet-level Endangered Species Committee met for the first time Tuesday. In unanimous votes, it exempted the Grayrocks dam in Wyoming from provisions of the Endangered Species Act as long as builders protect the whooping crane's habitat, and did *not* exempt the Tellico Dam in Tennessee so that the snail darter, a two-inch fish, might live. Sen. Howard Baker (R-Tenn.) will try to annul the Committee and its Tellico ruling. □