

matter of vaccinating a group of children and seeing whether or not they get the disease. Enormous numbers of children are exposed to polio every year, actually become infected, yet never get sick, much less paralyzed. For every person, child or grown-up, paralyzed by polio, there are at least 100 to 1,000 infected with the virus who escape paralysis and even recognizable sickness.

The reason for this is that a little of the virus, when it gets into the body, mobilizes the body's defensive forces. Some of the defenders are substances called antibodies. A large amount of virus may overwhelm the body's defensive forces, and in such a case, the person attacked gets sick with infantile paralysis.

Antibodies cannot be seen. To tell whether you have any polio antibodies in your blood, scientists would mix some of your blood serum with live polio virus and inject this into a mouse. If the mouse did not get polio, though the same amount of polio virus alone gave the disease to its sister mouse, it would show you had polio antibodies in your blood.

Fifteen years ago, this test could only be made on monkeys, which are expensive animals compared to mice. Now the neutralization test, as it is called, can be made on mice for one of the three polio viruses, the Lansing strain. The neutralization test can also now be carried out with all three virus types in test tube cultures of monkey testes and kidney.

Besides telling whether you have polio antibodies, the test can be made to tell how much antibody, thus giving an idea of the ability of your blood serum to neutralize the virus and thus protect you from the disease. This is done by seeing how much your serum can be diluted and still neutralize a given amount of polio virus. Scientists call this the titer of antibodies in your blood.

Fifteen years ago, when scientists were working on polio vaccines, they did not have such good methods for measuring the titer of polio antibodies. So, as Dr. Howe explained, the whole problem had to be studied over again.

For the trials in humans, six little boys and girls between the ages of two and five were chosen. These six and five others who were not vaccinated were inmates of Rosewood Training School, at Owings Mills, Md., near Baltimore. The children were low grade idiots or imbeciles who never left their beds, never played with other children, not even their ward mates, and almost never had any visitors. They were chosen for the study because it was thought they were least likely to have any contacts through which they might develop antibodies by natural exposure to polio virus other than the inactivated virus in the vaccine. And they were vaccinated in 1951, when there was very little polio in the region outside Rosewood. In Baltimore City and County from June through December of that year there were only 26 cases of infantile paralysis with paralysis, the lowest number in eight years.

At about the same time that the children

were vaccinated, five chimpanzees were given the same vaccine. Both children and chimps showed a rise of about the same degree in antibody level following the vaccination. Although the vaccine was made from all three types of polio virus, the antibody levels to the different strains were tested. For the Brunhilde strain, the response was not as good as for the Leon and Lansing. Dr. Howe hopes the vaccine can be improved in this respect.

Although the titers were low in the vaccinated children, it is impossible, Dr. Howe says, to state that they are too low to protect against paralysis. The same levels are enough to protect monkeys against paralysis, and much lower levels can be found in as much as a fourth of the adult population. Yet all of the latter are members of a group which is statistically immune, since on the average only two out of every 100,000 adults get the paralytic form of the disease in a whole year's time.

Some other chimps in the study got the vaccine mixed with an adjuvant oil. Within recent years scientists have found that virus vaccines can be made more effective by addition of such oils. The polio vaccine made with an adjuvant was more effective in raising the antibody titer in the chimps. Dr. Howe plans further study of this with the hope of being able to increase the vaccine's efficiency for humans through the use of an adjuvant.

Meanwhile, it is now known that vaccine trials on chimpanzees can be used as a guide to production of a vaccine that will be effective for protecting humans and in tests to determine how long it will protect, what dosage must be used, whether "booster" shots should be given and when, and for answering all the other questions doctors must have answered before trying a new preventive method for children on a large scale.

Science News Letter, November 1, 1952

NUTRITION

Proper Cooking Retains Nutritive Values of Meat

➤ MORE BEEF is coming on the market and housewives will be buying and using more of this meat. Even so, the thrifty ones will want to buy and cook it so as to make the most of its nourishing values. Beef and other meats are an important source of proteins, the essential body components used for building and repairing body tissue. The lean of beef is also a valuable source of B vitamins and of the minerals, phosphorus and iron. Beef fat contains a small amount of vitamin A.

Cooking, other processing and home and commercial storage bring about nutritive losses in meat, U. S. Department of Agriculture experts point out. In a new bulletin on beef (USDA-A1B84, Govt. Printing Office, 15 cents) the Department's Bureau of Human Nutrition and Home Economics gives the following information:

Meat shrinks when cooked; it loses water

through evaporation, and some of the fat, mineral matter, B vitamins, and protein in the drippings. Heat causes some destruction of vitamins, mainly thiamine. More thiamine is destroyed by long cooking, such as braising, than by shorter cooking methods. When cooked beef is kept warm for serving, there is further loss of this vitamin.

Under usual conditions, losses of nutritive value are not great enough to be a cause for concern, although it is advisable to keep them to a minimum.

Freezing does not alter nutritive values, but losses result if drip from thawed meat is not used.

A 3-ounce serving of cooked beef chuck (bone out) provides a little less than one-third of the protein and almost one-fourth of the iron and niacin recommended by the National Research Council as the daily allowance for a physically active man.

Liver, kidney, and heart contain as much protein as the muscle meats and are rich in the B vitamins and iron. Liver is an excellent source of vitamin A and a good source of ascorbic acid. It is important as a blood builder because of its iron and copper content.

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Symptoms of diseases such as high blood pressure, diabetes and arteriosclerosis show up in the veins, arteries and capillaries of the eye's retina long before more obvious symptoms appear.

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