



USING A CHICKEN in laboratory research are Richard D. Hendershott, assistant in Poultry Science, at left, and Dr. Gunning, right. Research animals are carefully cared for and never mistreated.

Both Animals and Humans Help in Study of

YOUR HEART AND "RISK" FACTORS

By B. E. Gunning and W. F. McCaughey

Development of nutritional research in the School of Home Economics has had a history of progress and expansion under the direction of Dr. Ethel M. Thompson, professor emeritus. As a result of her endeavors, the area of lipid (fat) metabolism has shown great strides. Dr. Thompson designed and developed projects utilizing both human and animal species.

In nutritional studies it is imperative that both of these species and the techniques applicable to each be evaluated. The human because of his personal health and consumer application of research findings to the human himself. In relation to the human, it is not feasible to apply all techniques but only the final principles derived from the animal studies. Human participation offers resolution of problems concerning food intake, general physical characteristics as re-

lated to health, and blood analysis data. Any procedures involving further complications are directed to the animal study level, or are those considered beneficial to the immediate needs of the individual. Often those techniques provide no immediate general application.

Where Factors Are Similar

The animal can be utilized to resolve problems related to functions that bear identity to individual organs, life span, more precise genetic involvement and growth under a system of more rigid control than is possible with man.

We often ask why more long term, large population efforts are not put forth to evaluate man himself. This is a difficult undertaking for an investigator if one considers the final results. There are few scientific researchers who are psychologically oriented to start a career with a group when the investigator knows from the beginning that he cannot see this group be completely evaluated during his life span.

Therefore, the value of the animal is of extreme importance in that several generations can be observed in a short period, large numbers can be included, and very precise control of food intake, temperature and other factors can be evaluated. Likewise, a scientist has much better control over the animal subjects, their behavior and activity, than is possible with humans.

These factors all bear relationship to the vast amount of work applying to the current concepts of lipid metabolism and "risk" factors involved.

Lipid Research Truly Vital

The field of lipid research has great impact not only on Arizona but for the entire world population. In man this ultimately associates itself with the problems of heart disease and its prevention. The 1963 census of U.S. deaths from all causes gives the spectacular figure of 54.1 percent attributed to cardiovascular diseases (those involving the heart and the flow of blood through the body).

Through years of research investigation we find certain "risk" factors related to cardiovascular diseases. These include heredity, sex, weight, cigarette smoking, high blood pressure, physical activity, emotional stress, personality patterns and nutrition. Although nutrition is the most important to some of us, the other factors warrant some comment. Heredity is difficult to control, but problems resulting from inborn errors if properly diagnosed and managed are not as serious as previously thought. Sex appears to have a tremendous influence as related to the development of cardiovascular diseases.

White men between 30 and 49 are 6.5 times more susceptible to cardiovascular disease than their female counterpart. By age 80 the incidence is very close. Cigarette smoking has been implicated as a very high, controllable "risk" factor, although some investigators suggest the cigarette smoker leads a more stressful life than the non-smoker. The cause may be emotional, rather than actual component of the cigarette itself.

Too Heavy a Load

Excessive body weight, probably the highest incident state of malnutrition (bad nutrition) existing in the U.S. population, is important. The exact

(Continued on Next Page)

Dr. Gunning is associate professor of nutrition, School of Home Economics and Dr. McCaughey is professor of biochemistry and nutrition, Department of Agricultural Biochemistry.

(Continued from Previous Page)

meaning of elevated blood pressure is not completely defined, although we do not tend to accept an increased heart work load, as well as a higher incidence of diabetes and other metabolic disorders, to be factors which increase cardiovascular disease risk.

Several theories have been put forth as to the exact role of high blood pressure, but no precise single effect has been demonstrated to date. Physical activity may be related to stress, relative body mass distribution (fat vs. muscle), and total circulation paths available for blood distribution.

Emotional Stress Is Factor

Emotional stress is probably related to personality patterns, and the increase in incidence of heart disease due to stress may be more highly associated with the individual response and management of the stress than with the stress itself. If this is true, then the "risk" factor would be more highly correlated with the personality pattern than with the stress applied. This may help to explain the high incidence of the disease in the male who works himself into a position requiring deadlines, aggressiveness and a display of competition and ambition.

Last, but certainly not least important, is the diet and its role, which is more intimately the concern of the nutrition research program in the school of Home Economics and Agricultural Biochemistry. The Ameri-

can Medical Association has suggested that food intake be modified to reduce the level of circulating fats (cholesterol). There is also a current interest in the circulating level of triglycerides. The three major areas of concern are:

- (1) Influence of dietary cholesterol, with the suggestion it be reduced within reason.
- (2) Concern for the intake of unsaturated fats (those which are liquid at room temperature), and that the intake be increased.
- (3) Consideration of the total fat intake.

Item three is currently a subject of great controversy as to whether the benefits will be derived from a reduction in total quantity or possibly even an increase, which may well be related to the balance of other nutrients. For example, if one maintains a normal intake of approximately 40 percent calories as fat, he may well maintain this level at the expense of sugar which is now implicated in the cardiovascular disease problem. If he lowers his fat intake, then a vast area of carbohydrate response activity develops as a result of his compensating through an increased intake of total calories.

A portion of the current work in Home Economics is designed to contribute answers to these problems.

A second article will appear in the next issue of *PROGRESSIVE AGRICULTURE IN ARIZONA*, discussing the nutrition research problems as undertaken by the graduate students.

Steve Fazio Hort. Head



STEVE FAZIO

He's so youthful appearing you don't realize that he has been on the Horticulture Department staff for 25 years — quarter of a century. What you are aware of is the fact that Prof. Steve Fazio is one of the nicest, most gracious people on this campus, one of the most patient and understanding — and understandable — classroom teachers, a man who knows and can describe lucidly the subject matter with which he deals.

All of this, of course, is leading up to the fact that Prof. Steve Fazio is now head of the Horticulture Department, as announced recently.

Steve has been on this campus a long time, having received his B.S. and M.S. degrees here before joining the department's staff in 1942. He had been acting department head for several months prior to appointment as permanent head.



VARIOUS PANELS, dials and gadgets make up the intricate instrumentation which scientists — in this case Dr. Gunning and Dr. McCaughey — use in research aimed at better human health.