in certain cultures. Capillary blood can be collected by trained field technicians rather than by para-health professionals, who are usually required for venous blood collection. The training of field technicians to collect capillary blood samples and to separate serum is simple, but necessary, and requires a minimal amount of time (typically 1 d). In the Sri Lankan study (2), a trained laboratory technician collected the finger-prick samples into ≥2 capillary tubes (75 mm each). Thus, ≥150 μL blood was typically collected and provided more than an adequate volume of serum necessary for the DSS preparation.

From our experience in Sri Lanka (2) and Guatemala (N Ahluwalia et al, unpublished observations, 2001) and that of others (4), whole blood ferritin is neither a reliable nor a valid tool in which to assess body iron stores, and results obtained from plasma ferritin vary (5). Thus, serum must be used for measuring ferritin to assess iron status. In our experience, when capillary tubes with an internal diameter of 1 or 1.5 mm are used for obtaining serum, the percentage of tubes that are rendered unusable is small.

Monárrez-Espino and Greiner present the difficulties experienced with the transport and use of a microcentrifuge in their survey in a “very isolated” community where electricity was not available. In our experience in Sri Lanka (2) and Guatemala (N Ahluwalia et al, unpublished observations, 2001), we did not encounter these difficulties. The samples were transported to the laboratory and centrifuged within 1–1.5 h of collection in Sri Lanka and centrifuged within 1–1.5 h of collection directly in the field with a microcentrifuge (weight: 10 kg) in Guatemala. In a highly remote setting where electricity is not available, some adaptations to centrifuging blood samples are necessary.

In our study with Sri Lankan children (2), the technician scored and broke off the spun capillary tubes without spillage after only minimal training. However, to address and potentially overcome this step—in collaboration with investigators from the Center for Studies of Sensory Impairment, Aging and Metabolism (Guatemala)—we recently finished a study in periurban Guatemala in which we used a special pipette and dispenser that make use of a special pipette and dispenser that make use of user-friendly techniques, such as cutting out a circle with a diameter equivalent to 20 μL serum from the DSS and measuring ferritin using our spot assay (2). We found that the DSS (blot and cut) approach provided ferritin values that did not differ significantly from values obtained from serum samples stored frozen until analyzed by the traditional method (6). We plan to publish the results of this study in the coming year. The cost of the pipette (range: $65–$235) or the special dispenser ($200) is a one-time cost only and most laboratories may already have this simple equipment.

In conclusion, the spot ferritin assay is based on DSS samples that can be prepared from either venous or capillary blood on filter paper by fieldworkers with minimal, but essential, training with the use of readily available or easily obtainable equipment. The advantages of this method need to be kept in mind when considering its use. These advantages include the lack of need for a cold chain, the stability of ferritin in DSS samples stored at room temperature for up to 1 mo, the ease of shipping DSS samples, and the reduced likelihood of transmission of certain blood-borne pathogens.

Enhanced lipogenesis after fasting

Dear Sir:

Wyatt and Hill (1) in their editorial about the excellent article by Weinsier et al (2) ask “whether it requires more physical activity to prevent weight regain than to prevent weight gain.” In the 1960s, Harry Antoniades and I conducted a series of studies involving insulin and a protein with a higher molecular weight that we called bound insulin, which now, I believe, is called insulin-like growth factor. We extracted and partially characterized bound insulin from human serum and from a rat liver perfusate to which we had added insulin. In one of our studies with Huber et al (3), we reported that the epididymal fat pads of rats deprived of food for 4 d and then refed ad libitum showed a marked increase in lipogenesis compared with the fat pads from control rats in the presence of glucose and either insulin or bound insulin. Although we only reported data after 7 d of refeeding, I recall observing enhanced lipogenesis in the rats refed for 20 d. I wrote in our article, “It would seem reasonable to ask whether the rapid accumulation of fat often observed in people after a period of dieting might not in part be the result of increased ability to synthesize fat.” This might answer, at least in part, the questions raised by Wyatt and Hill.

REFERENCES


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physical activity, increased energy intake, or both. If, in fact, metabolic or physiologic differences exist between gainers and maintainers, the role that these differences play are likely to be largely expressed through behavior.

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In search of a lifestyle prescription to control body weight

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Reply to SN Gershoff

Dear Sir:

We thank Gershoff for his kind words concerning our recent article in the Journal (1). We agree with the editorial comments of Wyatt and Hill (2) that it is possible that weight-reduced persons may have to exert more effort to maintain weight than do never-overweight persons. It is impossible to know whether this is due to an increased drive to eat, lower physical activity, or some metabolic factor such as enhanced lipogenesis, as proposed by Gershoff.

It does seem plausible that lipogenic enzymes may be up-regulated in response to a loss of stored fat, as previously reported by Huber et al (3). It is well known that up-regulation of glycolgen synthase occurs in skeletal muscle after the glycogen-depletion phase of glycogen supercompensation. We also observed supercompensation in muscle lipid storage after depletion of lipid in muscle induced by 2 h of running (4). However, this supercompensation only occurred when the euenergetic diet included 35% of energy as fat, so it is impossible to know whether lipid depletion, a moderately high-fat diet, or a combination of both factors were responsible for the lipid supercompensation.

We should point out that in our study comparing “gainers” and “maintainers” (1), no differences in fuel utilization (as reflected by fasting and 24-h respiratory quotients) or resting energy expenditure were found. This finding suggests that the differences in weight-gain patterns were probably based on behavior, expressed as increased energy intake, decreased activity-related energy expenditure, or both. In fact, the difference in activity-related energy expenditure between the gainers and maintainers over the 1 y after follow-up accounted for most of the observed weight gain in the gainers.

It is difficult to see how differences in fat tissue lipogenesis could cause weight gain in persons who are not in positive energy balance. However, it is possible that persons with an up-regulation of lipogenic enzymes may also have an increased appetite, perhaps through some feedback system originating in fat cells.

In conclusion, we believe that our data support the notion that much of the gain in body weight occurs because of decreased

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