



Changing needs in each life stage

Marta Van Loan discusses body composition through the life cycle

THERE is a continued concern about increasing rates of obesity and its impact on chronic diseases such as hypertension and diabetes. Many people are familiar with body mass index (BMI) as an indicator of overweight or obesity but few are aware of their actual body composition.

Body composition includes fat mass (FM) and lean body mass (LBM) or fat-free mass (FFM). Fat mass is the combination of adipose tissue and essential fats that contribute to proper bodily function. As an example, fat or lipid covers all nerves and serves as an insulator and is also found in every cell membrane in the body. LBM consists of muscle or protein, bone, water, and electrolytes. Fat mass is also to serve as an energy reserve providing calories during times of growth, illness, pregnancy and lactation.

Conversely LBM represents the energy utilising portion of the body and its metabolism. FM and LBM change from infancy through childhood into adolescence and adulthood. The 20s to mid-60s represents a period of stable body composition followed by age related changes in LBM by 70-80 years of age.

From infancy to four months of age body fat serves as a major energy source for continued growth and development of the infant.¹ Fat mass and LBM continue to increase throughout childhood and puberty until late adolescences. During the pubertal growth spurt girls mature sooner than boys on average about one and a half years earlier; the greatest growth in height occurs about age 8.6 years for girls vs. 10.4 years for boys. Height velocity is followed by peak weight velocity at about 12.3 years for girl and about 13.8 years for boys.²

Table 1

MEN		WOMEN	
% Body weight as fat	15%	% Body weight as fat	25%
% Body weight as lean mass	85%	% Body weight as lean mass	75%

By their mid-20s men and women have reached adult body composition with a mature skeleton and stable LBM and FM (assuming weight doesn't change). Men have more LBM than women and, therefore, as a percentage of body weight, less FM. These values are maintained throughout the mid-life years. Table 1 shows the average percentage fat and LBM for adult men and women.

However, in older years (mid-60s-mid 80s) there is a clear shift away from LBM to increased FM.³ This shift may be attributed to changes in diet, exercise and other lifestyle factors, but there are changes in overall metabolism as a result of declining hormones like growth hormone, oestrogen and testosterone – all of which lead to lower LBM, reduced metabolism, and greater FM.

To counter-act these normal processes associated with aging and stabilise LBM, older individuals should focus on diets that include lean protein, complex carbohydrate like whole grains, fruits and vegetables, and maintain a level of moderate physical activity most days of the week.

Adequate physical activity, both aerobic and resistance exercises, helps to ensure maintenance of LBM and also bone health; both muscle and bone respond positively to physical activity. Dairy foods are an excellent source of high quality protein⁴ and provide a source of other important nutrients like calcium for bone health which, among other

factors, is especially important for growing adolescents to assist in the development of the highest bone density possible, and for elders to maintain bone density. Additionally, dairy products may be a more affordable choice of high quality protein for elders on limited income.

In summary, changes in body composition are rapid during infancy, childhood and adolescences with the greatest change in height, weight, LBM and FM occurring in early adolescences. Stable body composition can be maintained through the mid to older adults years with adequate nutrition and regular physical activity. Maintaining good nutrition and physical activity levels are essential to meeting body composition needs and overall health throughout life.

Dr Marta Van Loan was the plenary session speaker at the recent symposium 'Body Weight & Body Composition Throughout the Life-Cycle' hosted by The Irish Nutrition & Dietetic Institute (INDI) in association with The National Dairy Council (NDC)

References

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