MAXIMAL MUSCULAR POTENTIAL FOR NATURAL MALE ATHLETES BY C. D. CHESTER

Martin Berkhan[1] published an article[2] in 2010 about the maximum potential of athletes who didn't use performance enhancing drugs and so on. He based his data off several clients of his that went on to compete in physique tourneys. He lists some of them in the article, but far more are not listed. Using his data, he made an accurate formula. Martin is so confident in his formula he had this to say:

> "Your final body weight at 5-6% will be a lot less than what you think. So[,] to all you keyboard experts that arrive at some fantasy stats and claim that my formula is wrong: bitch, please. Talk to me again when you get in contest shape."[3]

It should be noted that his formula only applies to males. His formula is simple:

$$(Height\ in\ cm) - (Limit\ characteristic) = Maximum\ Bodyweight\ in\ kg\ at\ 5-6\%\ BF$$

The Limit Characteristic[4] can be found using this formula:

$$Limit\ Characteristic = 0.1(Height\ in\ cm) + 82$$

Thus, combining the formulas yield:

$$0.9(Height\ in\ cm) - 82 = Maximum\ Bodyweight\ in\ kg\ at\ 5-6\%\ BF$$

In Imperial Units the combined formula looks like this:

$$\left[\frac{22.86(Height\ in\ inches) - 820}{4.5359237}\right] = Maximum\ Bodyweight\ in\ pounds\ at\ 5-6\%\ BF$$

If you want to know your potential is at say another body fat percent first find the maximum potential at 5% in kg. From there you can use this formula to find the maximum muscle mass you hold:

$$Maximum\ Muscle\ Mass = 0.95(Maximum\ Bodyweight\ in\ kg\ at\ 5-6\%\ BF)$$

---

[1] Martin is a nutritional consultant and personal trainer. He is also the founder of leangains.com.
[2] *Maximum Muscular Potential of Drug-Free Athletes*
https://leangains.com/maximum-muscular-potential-of-drug-free-athletes-updated-dec-31st/
[3] *Maximum Muscular Potential of Drug-Free Athletes*
https://leangains.com/maximum-muscular-potential-of-drug-free-athletes-updated-dec-31st/
[4] The Limit Characteristic was determined based off a linear regression of the height to number used in the *Limits of the Formula* section.

Next you need to input this and the body fat percentage you are aiming for:

$$Total\ Weight\ in\ kg = Maximum\ Muscle\ Mass + Aimed\ BF\%(Total\ Weight\ in\ kg)$$

Manipulating this formula to isolate the total weight in kg at a specific body fat percentage yields:

$$Total\ Weight\ in\ kg\ at\ Aimed\ BF\% = \left[\frac{Maximum\ Muscle\ Mass}{1 - (Aimed\ BF\%)}\right]$$

Note that the aimed body fat percent should be a decimal.[5]

We can now make a general case for the maximum potential at any reasonably achievable body fat range.

$$Total\ Weight\ in\ kg\ at\ Aimed\ BF\% = \left[\frac{Maximum\ Muscle\ Mass}{1 - (Aimed\ BF\%)}\right]$$

$$Total\ Weight\ in\ kg\ at\ Aimed\ BF\% = \left[\frac{0.95(Maximum\ Bodyweight\ in\ kg\ at\ 5 - 6\%\ BF)}{1 - (Aimed\ BF\%)}\right]$$

$$Total\ Weight\ in\ kg\ at\ Aimed\ BF\% = 0.95\left[\frac{Maximum\ Bodyweight\ in\ kg\ at\ 5 - 6\%\ BF}{1 - (Aimed\ BF\%)}\right]$$

$$Total\ Weight\ in\ kg\ at\ Aimed\ BF\% = 0.95\left[\frac{0.9(Height\ in\ cm) - 82}{1 - (Aimed\ BF\%)}\right]$$

$$\therefore \boldsymbol{Total\ Weight\ in\ kg\ at\ Aimed\ BF\% = 0.095\left[\frac{9(Height\ in\ cm) - 820}{1 - (Aimed\ BF\%)}\right] \pm 0.7}$$

Note that the formula derived is most likely around ±0.7 kg of the real answer (this is my best guess) as inferred by Martin. This is due to the fact that the "formula is not perfectly linear and is most accurate for men in the 170-190 cm height range. [It's very] … accurate for guys smack dab in the middle of that range (180 cm). Shorter guys (below 170 cm) seem to skew the formula towards being heavier. Vice versa for taller guys."[6] Regardless, the formula is very accurate.

---

[5] For example, 15% is represented as 0.15.
[6] *Maximum Muscular Potential of Drug-Free Athletes*
https://leangains.com/maximum-muscular-potential-of-drug-free-athletes-updated-dec-31st/