

Soy Formula Can Reduce Testosterone Levels

By Dr. Richard Sharpe

Senior scientist at the Medical Research Council Human Reproductive Sciences Unit in Edinburgh
Soy formula milk (SFM) is used in place of breast milk and cow's formula milk by some mothers (about two percent) in the UK and by nearly one-quarter of mothers in North America. Only in a tiny minority of cases can this use be justified on the grounds of (cow's) milk intolerance by babies.

Babies fed with SFM gain weight normally but there is concern that this feeding may expose the baby to abnormally high levels of 'oestrogens.' This is because soya beans, from which SFM is made, contain very high levels of chemicals called isoflavones, which are phytoestrogens (literally, plant-made chemicals that mimic the female sex hormone, oestradiol).

There is no evidence from humans that these phytoestrogens cause abnormal development of the babies, but few, if any, direct studies have been made. Scientists such as myself have concerns that, as exposure of babies to levels of phytoestrogens as high as in SFM does not occur normally, even in societies that each soy-rich diets (e.g. Chinese), then feeding of infants with SFM is an unnecessary risk to take on behalf of the baby.

It is ethically difficult to undertake studies in human babies who are being fed with SFM, and it is obviously impossible to collect tissue samples that would allow doctors to tell if the developing reproductive system, or other organs, of the baby are being affected by exposure to the phytoestrogens in SFM.

We have therefore done a feeding study with SFM in marmoset monkeys. We chose this species in particular because more than 80 percent of pregnancies are (non-identical) twin pregnancies, and this allowed us to use one twin as a control (fed with cow's formula milk) and his brother was fed with SFM. We chose to study only males because all male primates, including the human, exhibit a period after birth and lasting up to six months or more, in which the testes are very active and when levels of the male sex hormone 'testosterone' in blood can reach adult levels. This period is called 'the neonatal testosterone surge.' Nothing like it occurs in females.

To our surprise, we found that twins fed with SFM showed major suppression of their 'neonatal testosterone surge' when compared with their (control) twin brothers. This change was associated with a large increase in the numbers of Leydig cells in the testicles of the SFM-fed neonatal marmosets, which was surprising as these are the cells that make the testosterone. There is every reason to suppose that human male babies fed with SFM will show a similar suppression of their neonatal testosterone surge. Is this effect a cause for concern? Unfortunately, it is not yet possible to give a clear answer to this important question. The reason is that we do not know what the function(s) of the neonatal testosterone surge is in boys, though effects on growth of the penis and prostate gland and effects on the immune system are suspected.

Also we do not yet know whether there will be any long-term changes in the SFM-fed marmosets when they become adults, though we should have some answers by the end of this year--we know already that their fertility is unaffected. My expectation is that there will be no major or adverse long-term changes in SFM-fed males, but this is just my hunch and remains to be confirmed by facts.

So what would I recommend to new mothers? I am a very strong believer in 'breast is best'--all four of my children, including one set of twins, were breast-fed. If not breast-feeding, I would recommend feeding with cow's formula milk, which is tried and trusted. I would not recommend feeding babies with SFM, not because it is proven to cause harm (because it is not) but because it is dabbling with the unknown and therefore taking an unknown risk (on behalf of the baby).

If a baby develops a true intolerance to cow's formula milk, which is very rare, then SFM can be used in the knowledge that millions of children worldwide have been reared on it without any major problems as far as we are aware. Mothers who have to choose SFM by force of such circumstances should therefore do so without worrying that they will harm their baby. But where there is a choice I would not recommend SFM.

Dr. Richard Sharpe is a senior scientist at the Medical Research Council Human Reproductive Sciences Unit in Edinburgh. He is an expert on all aspects of male reproductive development and function. He was a member of the Expert Committee that advised the Foods Standards Agency in compiling their report on 'Phytoestrogens and Human Health,' which will be published this summer.