Acidification of infant formula feeds

The article by Joosten and Lardeau in this issue of *SAJCN* (p. 87) looks at the microbiological safety of acidified infant formula feeds as tested *in vitro*. The authors rightly point to diarrhoea as being one of the leading causes of morbidity and mortality among infants in developing countries, especially those under the age of 5 years. Such diarrhoea is often associated with poor hygienic conditions and subsequent contamination of made-up infant feeds with potential enterobacterial pathogens. It is known that breast-feeding reduces exposure to these potential pathogens as well as supplying the infant with appropriate nutrients and protective antibodies, so decreasing the incidence of diarrhoea. Breast-feeding remains the method of choice. However, where this is not possible (and there may be good reasons for this), formula feeding may be necessary. If formula feeding is to be undertaken, it is advisable that measures be put in place to minimise contamination of the made up feed from potential enteropathogens. In the real world, boiling of the water used to reconstitute such feeds and disinfection of feed bottles is not always possible or easy.

The authors point to acidification of the feed artificially as a possible way to prevent contaminating organisms from proliferating. This is achieved by the addition of lactic acid to such formulas.

The *in vitro* testing carried out to corroborate such a supposition pointed to an acid pH of less than 5 as being bacteriostatic for most enteropathogens and even bactericidal for some. It was interesting to note that the organisms used in the *in vitro* test procedures were all common potential pathogens of the gastro-intestinal tract and included members of the Enterobacteriaceae as well as *Staphylococcus aureus*, *Bacillus cereus*, the yeast *Candida albicans* and a rotavirus.

After the inoculation into appropriate media, these were then incubated at temperatures of 4, 25 and 37°C. Growth or inactivation of the various organisms by the lowered pH was then assessed. Anti-rotavirus activity was determined via an alpha-type neutralisation test against two rotavirus serotypes.

The important observation of the lowered pH on organism growth and inactivation may provide a safe alternative to the usual aseptic techniques in preparing infant formula feeds, where such precautionary measures are not possible. However, as correctly indicated by the authors, further work will be necessary to confirm the clinical relevance of such *in vitro* findings and whether the formula ingredients are in any way adversely affected by the low pH.

A A Forder

Department of Medical Microbiology
Tygerberg Academic Hospital
Tygerberg, W Cape

Further reading

Ayliffe GAJ, Fraise AP, Geddes AM, Mitchell K. *Control of Hospital Infection — a Practical Handbook*. 4th ed. London: Arnold, 2000.