Background
Wheat grain and particularly the aleurone layer (Fig. 1) contain high amounts of dietary fibre. Fermentation of dietary fibre by human gut flora may enhance level of short-chain fatty acids (SCFA) which are potentially chemoprotective e.g. by suppressing the growth of tumour cells. Furthermore lower amounts of potentially tumour promoting products such as deoxycholic acid (DCA), ammonia and hydrogen peroxide ($H_2O_2$) may be produced.

Methods
Wheat aleurone, whole meal wheat flour and wheat bran were digested and fermented in vitro. Fermentation supernatants (fs) were analysed for SCFA, DCA, ammonia and $H_2O_2$. Corresponding mixtures of SCFA and the individual substance butyrate were prepared. HT29 adenocarcinoma cells were treated for 24-72 h with butyrate, mixtures or complex fs. Cell survival was determined by quantifying fluorescence of DAPI-labelled DNA.

Results
Fermented wheat samples contained 2-3 fold higher amounts of SCFA than control (Fig. 2, 3).

Fermented wheat samples contained reduced levels of DCA. $H_2O_2$ production was not influenced whereas more ammonia was produced (Tab. 1, 2).

Fermented wheat samples suppressed growth of tumour cells. Fs inhibited cell growth more than synthetic mixtures. Growth inhibitory activity of SCFA was mainly caused by butyrate (Fig. 4).

Conclusions
Gut flora-mediated fermentation of wheat aleurone independently from variety results in reduced level of tumour promoting DCA and higher levels of SCFA especially butyrate, which inhibits growth of human adenocarcinoma cells. The fact that complex fs were more cytotoxic than corresponding synthetic mixtures of SCFA and butyrate point to the involvement of additional growth inhibitory effects of other bacterial metabolites. Most of the activities of whole meal and of bran are due to their contents of aleurone.

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