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# The effects of fructo-oligosaccharides or whole wheat on the digestive bacterial community of broiler chickens using fingerprint methods

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## OBJECTIVES

January 2006 : in the European Union, ban of antibiotic growth promoters (AGP) from animal feed

→ Search for **alternatives** to AGP to control the balance of the digestive microflora

## METHODS

### Experimental diets

- (1) a negative control (ground wheat based) with no additives
- (2) a positive control containing an AGP (0.01 g/kg avilamycin)
- (3) a diet containing 0.6 g/kg of short chain **fructo-oligosaccharides (FOS)**
- (4) as the Nc diet, but with **whole wheat** (40%)

### Broiler chickens

- 6 replicate pens / dietary treatment
- 3 weeks of age : sampling of ileal, cloacal and caecal contents (pools of 6 birds / pen)

### Analysis of predominant digestive microflora

- by two fingerprint methods (universal primers)
- Temporal Temperature Gradient gel Electrophoresis (TTGE)
- Capillary Electrophoresis Single-Strand Conformation Polymorphism (CE-SSCP) (6-Fam and Hex labelling)

## RESULTS

### Dietary treatments

### Specific bands (Figures 1 to 4)

<b>Avilamycin</b>	→	CE-SSCP	Disappearance of several bands in the three digestive contents / Appearance of a band in the caeca
		TTGE	Presence of a band corresponding to long segmented filamentous micro organism in the cloaca
<b>FOS</b>	→	CE-SSCP	Appearance of bands in the cloaca and in the caeca
		TTGE	Appearance of a band corresponding to segmented filamentous bacterium in the ileum
<b>Whole wheat</b>	→	CE-SSCP	Appearance of a band in the ileum
		TTGE	Appearance of 2 bands corresponding to segmented filamentous bacterium and <i>Lactobacillus salivarius</i> in the ileum Disappearance of a band corresponding to <i>Escherichia coli</i> in the cloaca

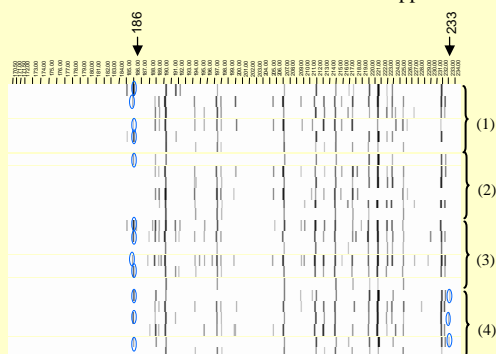


Figure 1. Fingerprints of CE-SSCP (6-Fam labelling) from pools of ileal contents (6 individuals)

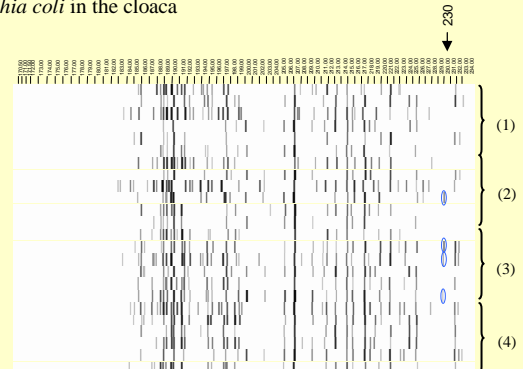


Figure 2. Fingerprints of CE-SSCP (6-Fam labelling) from pools of cloacal contents (6 individuals)

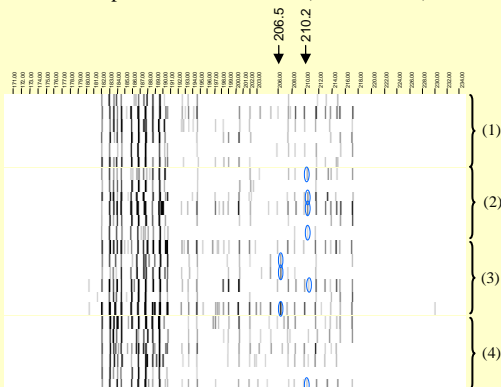


Figure 3. Fingerprints of CE-SSCP (Hex labelling) from pools of caecal contents (6 individuals)

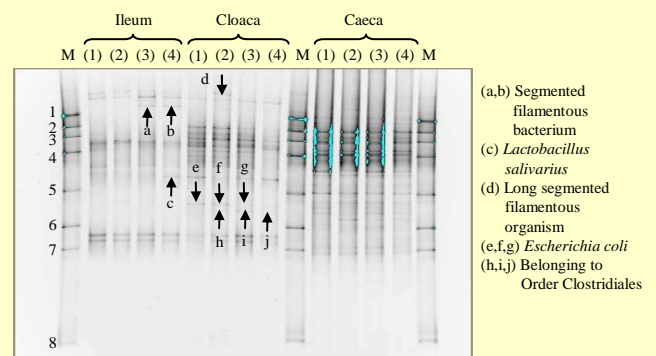


Figure 4. Fingerprints of TTGE from pools of digestive contents (36 individuals)

**AGP and two potential alternatives to AGP, FOS and whole wheat, lead to digestive microflora modifications**



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