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# **Probiotic properties of lactic acid bacteria isolated from traditionally fermented Xinjiang cheese**

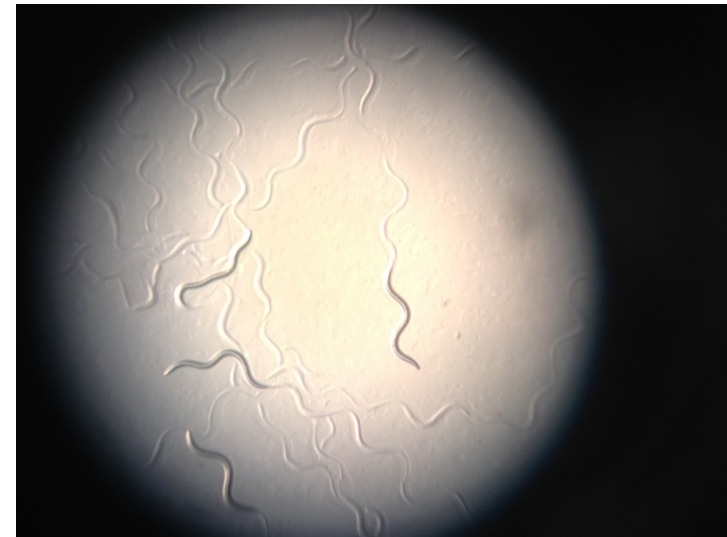
**Key words:** Xinjiang cheese, Lactic acid bacterial (LAB) strains, Probiotic properties, *Caenorhabditis elegans*, Lifespan

# Research Summary



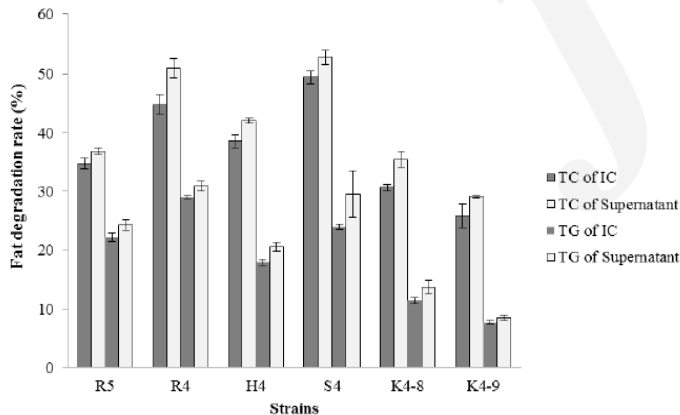
This study aimed to evaluate potential traits of probiotic strains selected from cheese products of Xinjiang using *in vitro* tests and the *in vivo C. elegans* model:

- Xinjiang Cheese
- LAB strains
- Probiotic properties
- *Caenorhabditis .elegans*
- Lifespan



# Highlights

1. We collected traditionally **fermented cheese products** from four unique regions of Xinjiang.
2. **Six potential probiotic strains** were isolated from cheese samples.
3. **Antioxidant and fat degradation abilities** of screened strains *in vitro* were determined.
4. *Lactobacillus rhamnosus* R4 and *Lactobacillus helveticus* S4 strains show lifespan extending abilities on *Caenorhabditis .elegans* model system.



Strains	H4	K4-8	K4-9	R4	R5	S4
Cell morphology	Coccus	Coccus	Coccus	Rod	Coccus	Rod
Surface appearance	Off-white, smooth moist	Off-white, smooth moist	Off-white, smooth moist	Milky white, smooth moist	Off-white, smooth moist	Milky white, smooth moist
Gram staining	+	+	+	+	+	+
Gas from glucose	+	+	-	+	-	-
Catalase test	-	-	-	-	-	-
Milk curd test	+	-	-	+	+	+
Growth at 45°C	w	-	w	+	-	+
Growth at 60°C	w	-	-	w	w	-
pH 3.0	+	+	+	+	+	+
pH 9.0	-	-	-	+	-	+
Hydrolysis of:						
Arginine	+	+	-	-	+	-
Aesculin	+	+	-	+	+	-
Carbohydrate fermentation:						
Glucose	+	+	+	+	+	+
Sucrose	-	+	+	+	-	+
Fructose	+	+	+	+	+	-
Galactose	+	+	+	+	+	-
Sodium gluconate	-	-	-	-	-	-
Lactose	-	+	+	-	+	-
Mannitol	+	-	-	-	+	-
Preliminary results	<i>Enterococcus</i>	<i>Enterococcus</i>	<i>Enterococcus</i>	<i>Lactobacillus</i>	<i>Enterococcus</i>	<i>Lactobacillus</i>

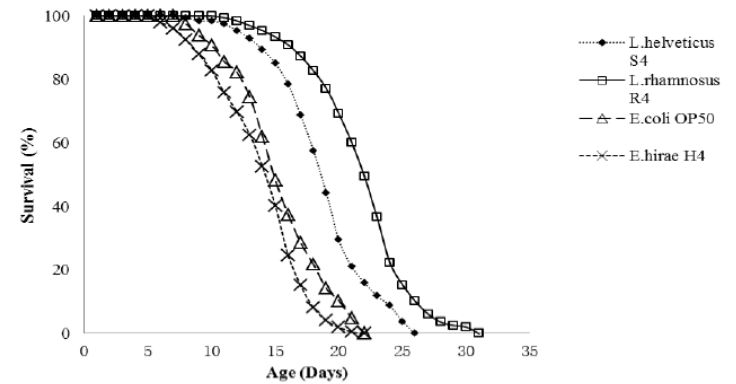


Fig.4 Survival curves of *C.elegans* fed with *L.rhamnosus* R4, *L.helveticus* S4, *E.hirae* H4 and *E.coli* OP50, respectively. Day 0 represents the first day that the L4 stage worms were transferred to NGM plates.

# **Some tables and figures were given to summarize the probiotic properties of LAB strains**

**Table 1 Survival rate of 6 strains at pH 3.0 and 0.3% bile salt in MRS medium.**

**Table 2 Antimicrobial activities of 6 selected strains on pathogens (inhibition zone in mm).**

**Table 3 The auto-aggregation and hydrophobicity activities of 6 selected strains.**

**Fig.1 Tolerance of 6 strains to different bile salt conditions.**

**Fig.2 Scavenging abilities of 6 strains to DPPH free radicals and hydroxyl radicals.**

**Fig .3 Cholesterol (TC) and triglycerides (TG) degradation activities of 6 selected strains.**

**Fig.4 Survival curves of *C.elegans* fed with *L.rhamnosus* R4, *L.helveticus* S4, *E.hirae* H4 and *E.coli* OP50, respectively.**