

L. rhamnosus GG and *L. casei* Shirota growth on a medium enriched with rye protein and assessment of DPP-IV inhibitory activity

Areli Elizabeth García-Escamilla¹, Zaira Daniela Solís-Macías¹, Gabriela Mariana Rodríguez-Serrano², Luis Guillermo González-Olivares¹, Jesús Guadalupe Pérez-Flores¹, Elizabeth Contreras-López¹, Laura García-Curiel³, and Emmanuel Pérez-Escalante^{1,2*}

Área Académica de Química. Universidad Autónoma del Estado de Hidalgo. Ciudad del Conocimiento. México.¹
Departamento de Biotecnología. Universidad Autónoma Metropolitana, Unidad Iztapalapa. División de Ciencias Biológicas y de la Salud. México.²
Área Académica de Enfermería. Universidad Autónoma del Estado de Hidalgo. Instituto de Ciencias de la Salud. México.³

*corresponding author: emmanuel_perez@uaeh.edu.mx

INTRODUCTION & AIM



Type 2 diabetes is considered a severe problem for the public sector around the world.^[1]



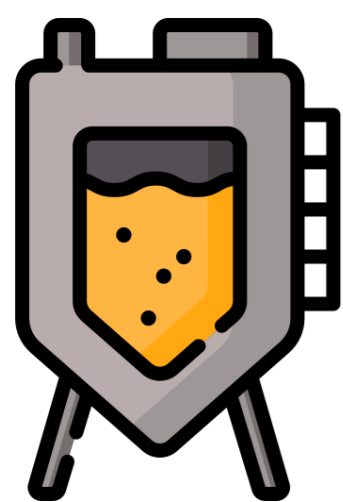
DPP-IV inhibitors have shown a favorable therapeutic profile for glycemic control.^[2]



This work aimed to evaluate the growth of two probiotics on a fermentation medium enriched with rye protein and determine the antidiabetic capacity from protein hydrolysis by these bacteria.

METHOD

Fermentation medium



- Rye protein isolate at 7.5%.
- Glucose at 1%.
- Phosphate buffer at 0.1 M and pH=6.8.
- Thermal treatment at 90°C for 10min.
- *L. rhamnosus* GG and *L. casei* Shirota inoculum at 1%.

Fermentation conditions and analysis

- Fermentation at 37°C for 24 h.
- Viable count in MRS agar.
- Supernatant obtention at 10,000 rpm and 4°C for 10 min.
- Free amino groups and DPP-IV inhibition by spectrophotometric methods.^[3]



RESULTS & DISCUSSION

Table 1. Probiotic growth on rye protein-enriched medium.

Bacteria	log CFU/mL	
	0 h	24 h
<i>L. rhamnosus</i> GG	7.58±0.02	9.72±0.10
<i>L. casei</i> Shirota	8.47±0.07	10.52±0.07

Both strains could grow in the proposed medium by two logarithmic cycles and overcome the minimal recommendable probiotic concentration in fermented products (at least 10⁷ CFU/mL).^[4]

Table 2. Free amino groups released by each strain.

Bacteria	[Free amino groups] (mg/L)	
	0 h	24 h
<i>L. rhamnosus</i> GG	163.33±6.97	167.50±1.54
<i>L. casei</i> Shirota	11.80±0.00	891.78±48.92

L. casei Shirota released the highest number of free amino groups, indicating its higher nitrogen requirements. This behavior has been shown in other fermentation media, such as milk.^[5]

Table 3. DPP-IV inhibition produced by each strain.

Bacteria	Inhibition (%)	
	0 h	24 h
<i>L. rhamnosus</i> GG	5.72±0.14	20.32±0.95
<i>L. casei</i> Shirota	10.37±1.04	27.04±1.57

Both fermentation processes allowed the release of protein fractions with DPP-IV inhibition, where *L. casei* Shirota showed the highest capacity, which was very similar to that reached in sorghum fermentation (~30%).^[6]

CONCLUSION

The rye medium allowed the growth of both strains to reach adequate levels for probiotics. A similar increase in bioactivity was found in the fermentation systems tested, representing an excellent opportunity for developing fermented products from vegetable sources.

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