

LET'S SHARE
**CLEAR
IDEAS**
ABOUT GELATIN

CHOOSING THE RIGHT SHELL EXCIPIENT TO MEET FUTURE CAPSULE CHALLENGES

Excipients play a key role in the formulation and performance of pharmaceutical hard and soft capsules
THE MOST COMMON EXCIPIENTS INCLUDE:



GELATIN

Derived from natural animal sources



HYDROXYPROPYL METHYLCELLULOSE (HPMC)

- Obtained from shredded trees
- Etherified with chemicals methyl chloride and propylene oxide
- Chemically modified cellulose polymer

PULLULAN

Obtained from the biotechnological fermentation of hydrolyzed starch by the action of the fungus *A. pullulans*



MODIFIED (HYDROXYPROPYL) STARCH

Corn crops, etherified with hydroxypropyl groups

91%



**GELATIN IS THE PREFERRED
EXCIPIENT OF CHOICE,**
accounting for the highest revenue of
the hard and soft capsule market in
2019¹ (estimates)

IT WAS EVEN USED IN THE FIRST EVER PRODUCTION OF CAPSULES



Reaching Further
Together

Rousselot

DARLING
INGREDIENTS

1

CLEAR LABEL



Number one trend
in 2017 by Innova
Market Insights

- Gelatin is a safe ingredient of natural origin
- Does not contain additives
- Facilitates free-from claims
- Non-allergenic
- Fully digestible and compatible
- Neutral in flavor and color

DID YOU KNOW?

HPMC, pullulan, and modified starch capsules are all additives and are therefore classed as **e-numbers**



2

SUPERIOR TECHNICAL PERFORMANCE

Gelatin provides functional properties for immediate release dosing and optimal formulation stability



- Optimal API release²
- Low oxygen permeability
- Good restricted water permeability
- Good mechanical resistance³

9.25

the average time it takes for a gelatin capsule to rupture⁵



MINUTES

27.25

the average time it takes for a modified starch-based capsule to rupture⁶

50X SLOWER

OXYGEN TRANSFER IN GELATIN CAPSULES COMPARED WITH HPMC SHELLS⁴

3

OPERATIONAL EFFECTIVENESS

Gelatin has a number of manufacturing advantages over alternatives such as HPMC, pullulan and modified starch:



- High level of machinability
- Proven manufacturing technology
- Greatest cost efficiency

MOST RELIABLE WEIGHT STABILITY PROFILE

Average weight variation measured⁷



	Gelatin HC (size 1)	HPMC HC (size 1)	Pullulan HC (size 1)
RSD (%)	1,7	3,0	2,2

40%

less raw material is required to manufacture gelatin capsules than HPMC alternatives⁸

DID YOU KNOW?

There are 5 global gelatin manufacturers and many local players, which ensure the continued supply of consistent gelatin. This compares with only a few pharmaceutical grade HPMC, pullulan and modified starch suppliers



Rousselot is the worldwide leader in pharmaceutical gelatins⁹



- ✓ Global expertise
- ✓ Dedicated local teams
- ✓ World class products
- ✓ Highest quality & safety standards
- ✓ Full responsibility
- ✓ Product integrity

>25% of capsules are sourced with Rousselot gelatin¹⁰



Rousselot Headquarters

Rousselot B.V. Kanaaldijk Noord 20 5691 NM Son The Netherlands
+31 499 364 100 gelatin@rousselot.com

References available upon request

[in](#) [twitter](#) @RousselotGlobal / #clearideas

rousselot.com

Rousselot

DARLING
INGREDIENTS