



COMPARISON OF POWDERED HONEY OBTAINED BY VACUUM DRYING AND LYOPHILIZATION



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INTRODUCTION

Powdered honey is increasingly popular among food, cosmetic and pharmaceutical industries, small and medium-sized enterprises, as well as restaurants of haute cuisine. Vacuum drying and lyophilization are nowadays common techniques to dehydrate foods, but the stickiness makes dried honey difficult for handling, so that filler materials are usually added before dehydrating. Data about lyophilized honeys are very limited, despite there being patents about lyophilization applied to honeys.

OBJETIVE

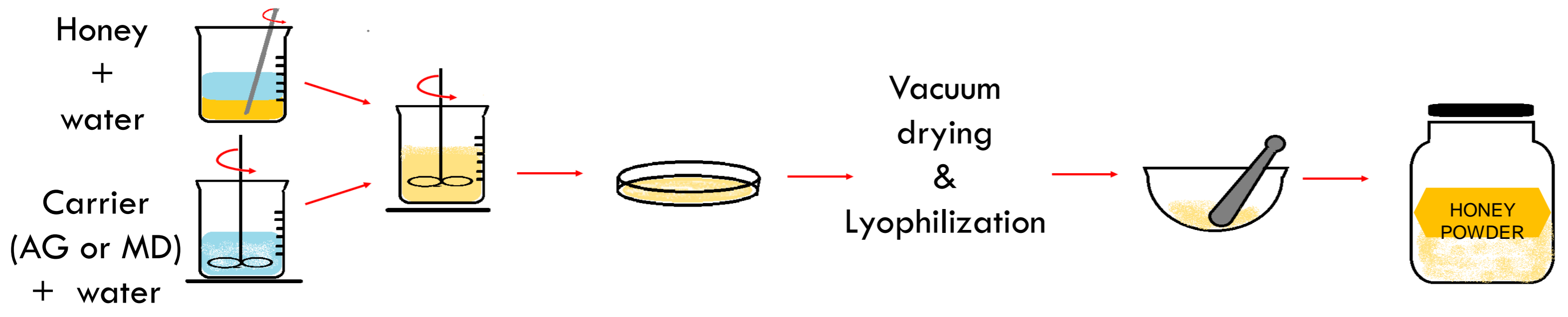
The aim of this study was to assess some features of honey powders obtained by vacuum drying and lyophilization using arabic gum (AG) and maltodextrin (MD) as drying aids, trying to achieve a powder with the maximum amount of honey possible

MATERIAL AND METHODS

- 1 Three heather honeys harvested in 2018 in Spain
- 2 Honey + Carrier → Powdered honey

MOISTURE (%)
WATER ACTIVITY
ELECTRICAL CONDUCTIVITY (mS/cm)
pH

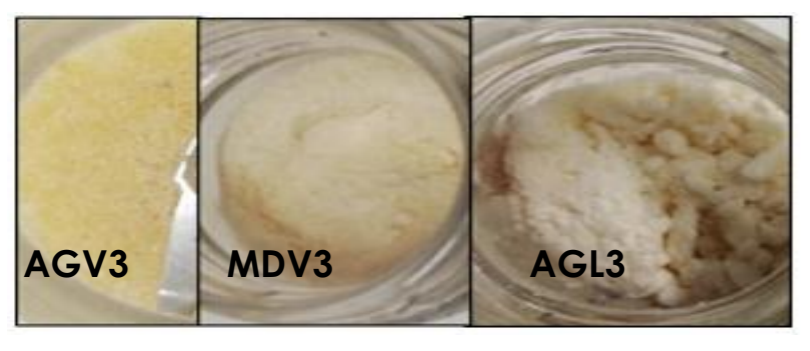
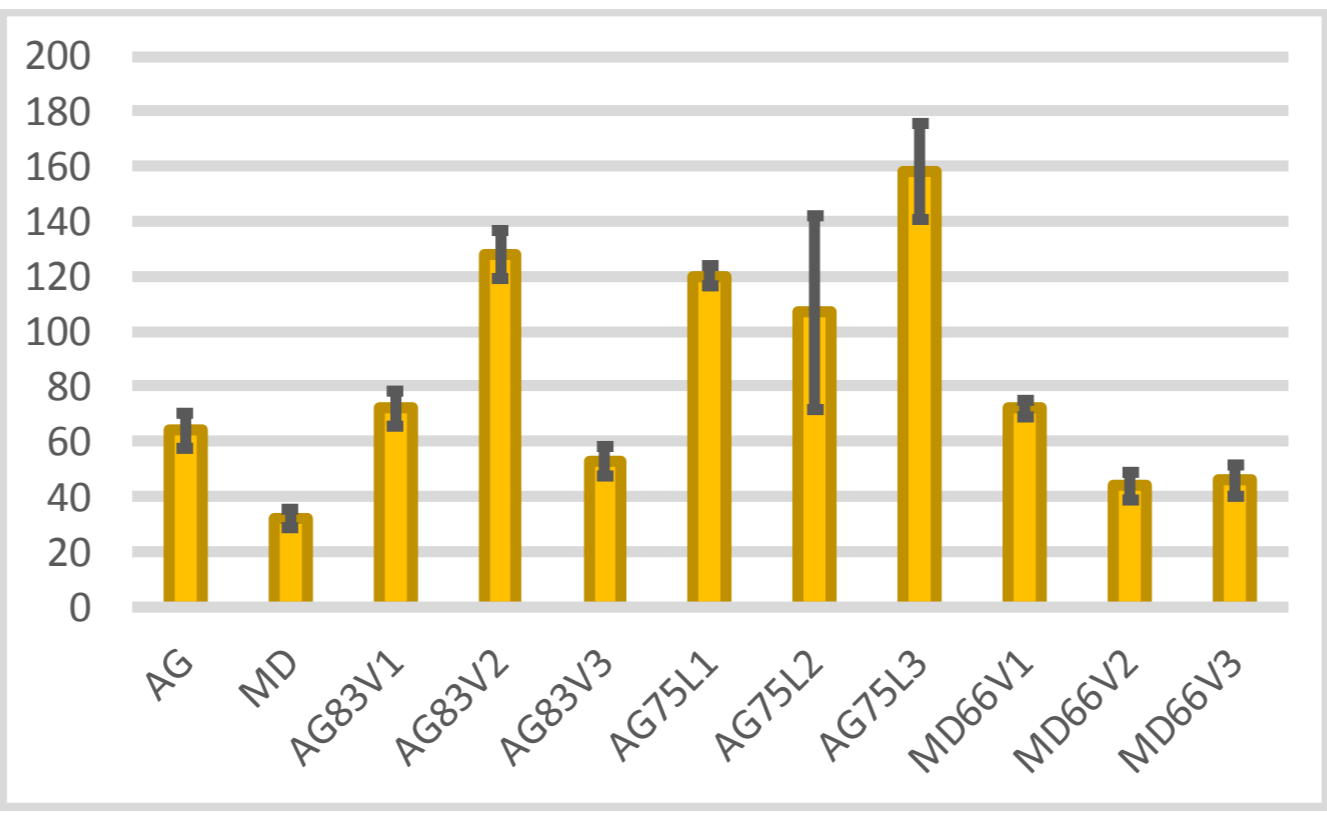
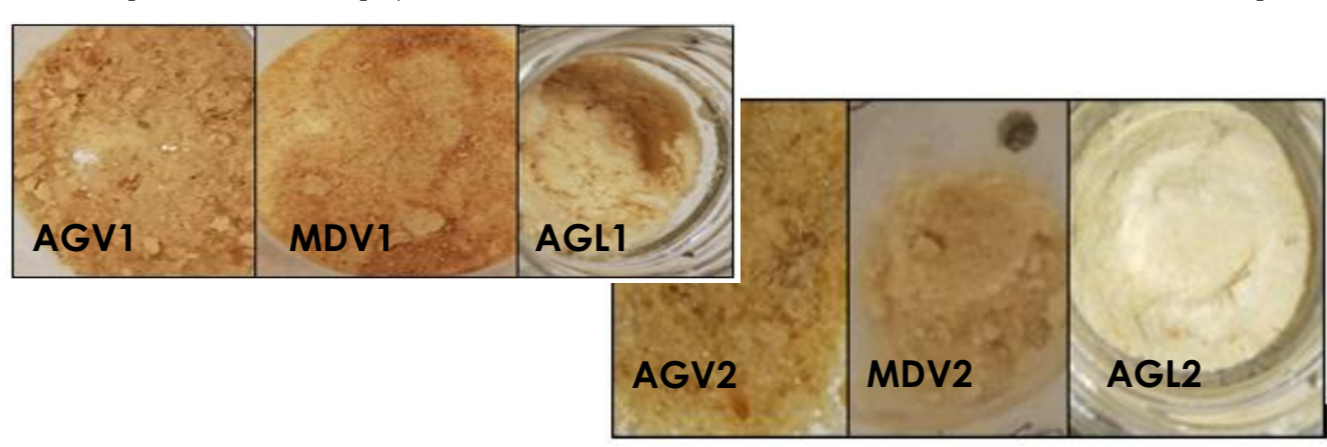
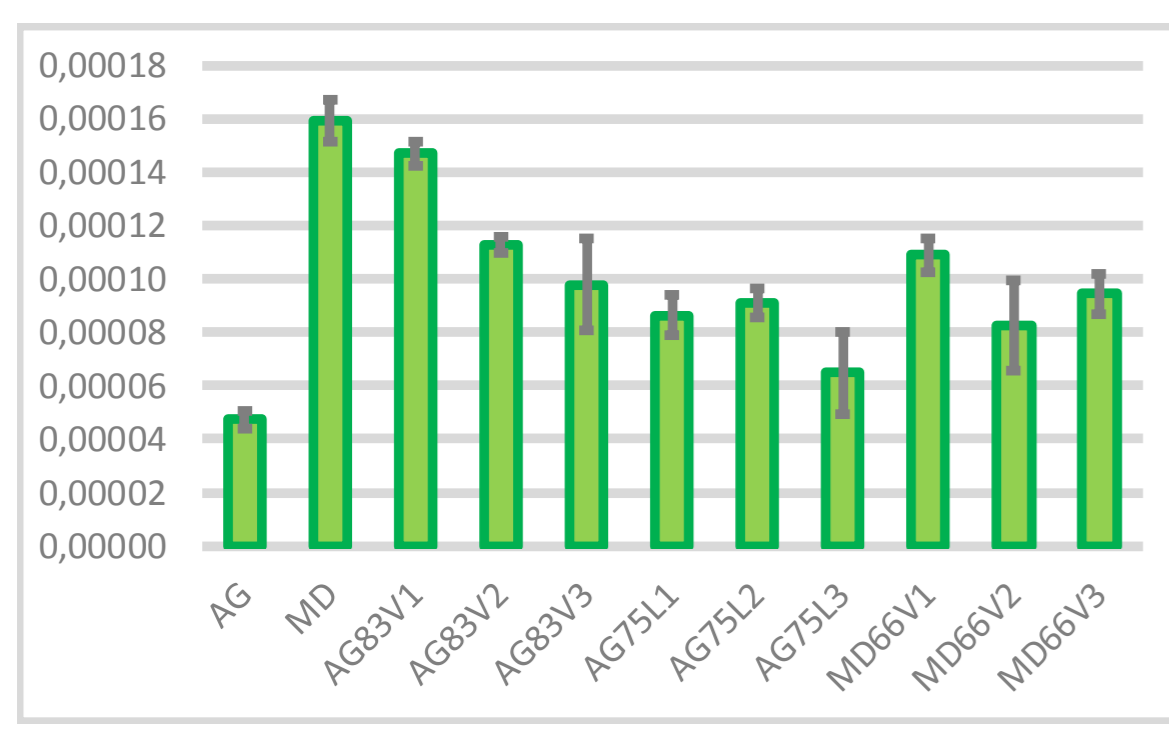
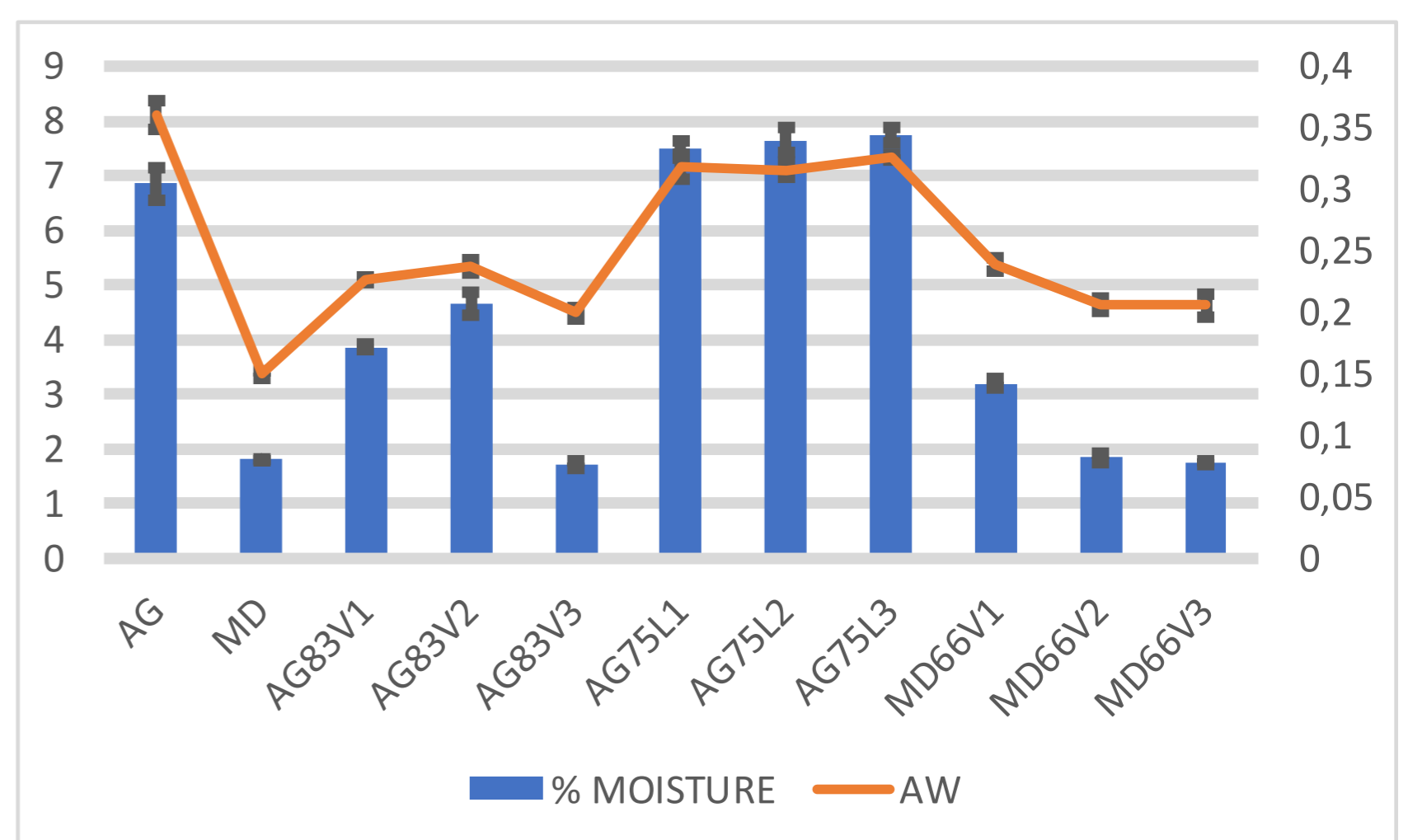
COLOUR (L*, a*, b*)
DIASTASE ACTIVITY (Schade scale)
HMF (mg/kg)
FREE AND LACTONE ACIDITY (meq/kg)



RECOVERY (%)
REHYDRATION (s)
HYGROSCOPIC RATE
MOISTURE (%)
WATER ACTIVITY
COLOUR (L*, a*, b*)

RESULTS

All honeys fulfilled the European regulations regarding the analyzed parameters. Using AG as carrier, the best blends for vacuum drying and lyophilization were achieved with 83% and 75% honey, respectively. Employing MD as carrier, the best blends for vacuum drying and lyophilization were attained with 66% and 50% honey, respectively. However, the lyophilized blends with 50% honey were very gummy, sticky and difficult to handle, so that they were discarded for further research. Powder recoveries were similar in all samples, ranging from 94% to 99%. Both moisture percentages and water activity values were higher in lyophilized honeys (7.63% and 0.320, respectively), than in vacuum dried honeys (2.84% and 0.219, respectively).



Vacuum dried MD-honey blends showed the fastest rehydration (54 s). Lyophilized honeys showed lower hygroscopic rates, probably because their moisture percentages were higher than those of the vacuum dried honeys. With regard to colour, L* decreased, while a* (redness) and b* (yellowness) increased with the amount of honey in the powder. Our vacuum dried honeys exhibited higher moisture percentages and darker colours than those described in the literature for other similar samples, possibly because we used higher amounts of honey in our blends.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge financial support from the Junta de Castilla y León (Spain), under the Grant Code BU041G18.