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Research area: e.g. Product aims

Paper, paperboard and board // Packaging papers and paperboard

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Key words:

Residuals as raw material, hop and wine production

TITLE:**Non-wood pulp substitutes from hop and wine production for paper board production****Background/Problem area**

In the context of raw material planning paper industry is looking for new raw materials as complement to the common raw materials based on virgin and recycled fibres. Next to the use of annual plants residuals from agriculture and food production are under investigation. The use of this kind of raw materials is interesting for paper products with direct food contact like paper based dishes or trays. But also other applications are obvious like paper tubes or boxes of corrugated board. In the hop and wine production different residuals arise like stalks or residuals from hop extraction, which offer interesting properties and potential to function as raw material for paper or board production.

Objectives/Research results

The objectives of this research project are to proof the potential of residuals from hop and wine production as raw material for paper board products. In this context the influence of the use of the residuals grape stalks and residuals from hop extraction on the paper making process, paper board properties and profitability is to be evaluated.

In the project residuals from hop extraction and wine farming (grape stalks) were milled (dry process) to derive organic particles smaller than 200 µm. These particles were characterized by means of particle size, particle shape, surface charge and extractable components to evaluate the impact on paper making process. In a next step single und multi-layer boards containing up to 50 wt.-% residuals were produced in lab scale (Rapid Köthen, grammage range 150 – 300 g/m²). The board samples were characterized by means of thickness, density and mechanical properties. It was shown, that by adding residuals the thickness by a given grammage was increased and the density was decreased due to a bulk effect of the residuals used as a kind of filler. On the other hand mechanical properties like breaking or interlaminar strength declined, which leads to the need of using strategies like using starch to compensate the decline, if the targeted application demands it.

In the final step of the project the process was scaled up on pilot plant scale. Papers containing 25 % of residual material were produced (grammage 100 g/m² and 200 g/m²). The papers show a sufficient mechanical stability. They can easily be converted to paper tubes and small folding boxes, they are recyclable and compostable. Due to insufficient organoleptic properties and bleeding resistance the papers cannot be used for direct food contact. By lowering the amount of residual materials in the papers food contact properties could be improved significantly so that direct food contact is possible. The determined ecological data lead to a positive rating of both non-wood pulp substitutes.

Application/Economic benefits

Paper boards containing significant amounts of residuals from hop and wine production are a new interesting product particularly for small and medium-sized enterprises (SME) in the area of paper and paper board production. SME are flexible enough to incorporate new raw material options and new paper and paper board species in their product portfolio. In addition to that smaller production masses of these kind of specialities fit to their business model. Moreover enterprises in the area of hop and wine production would profit from the option, to have a new application for residuals. To close the circle these enterprises could use the resulting paper and paper board products for their own products. Especially SME could profit from this advertising effect for specific products. The competitiveness of the beer and wine producing companies, comprising a lot of small and medium sized enterprises in Bavaria, would be improved.

Period of time: e.g. 01.02.2013 – 31.01.2014

Remarks

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