



BETTER BASICS
LABORBEDARF

INFORMATION ABOUT

**30% EFFICIENCY IMPROVEMENT BY USING
IN FOOD CHEMISTRY AND LIFE SCIENCE**

30% INCREASE IN EFFICIENCY BY USING

THE SMARTRACK® IN FOOD CHEMISTRY, LIFE SCIENCE

The enzymatic cleavage of gelatine by bromelain was studied with the aim of quantifying the potential increase in efficiency by using the SmartRack®. The experiment was divided into three stages: Setup, Execution and Degradation. The processes with and without SmartRack were directly compared, assuming a 30% increase in efficiency through the use of the laboratory organisation system.





Use of a pipette and a laboratory threaded bottle in front of a SmartRack® classic

Abstract

The enzymatic cleavage of gelatine by bromelain was studied with the aim of quantifying the potential increase in efficiency by using the SmartRack®. The experiment was divided into three stages: Setup, Execution and Degradation. The processes with and without SmartRack were directly compared, assuming a 30% increase in efficiency through the use of the laboratory organisation system.

Without the catalysis of reactions, many vital processes in the organism would not be fast enough to meet energy and metabolic needs. At the same time, enzyme-dependent processes are very sensitive to exogenous influences. They require a constant, standardised laboratory environment with standardised temperature, pH, humidity and other working conditions. Whether the SmartRack® can support these high requirements was investigated in the following experiment.

Methodical simulation of enzymatic reactions in food chemistry

This study investigated the effectiveness of the SmartRack® system compared to no laboratory organisation system on the efficiency of set-up, execution and breakdown. Data were collected on the enzymatic cleavage of gelatin in gummy fruits using bromelain, an enzyme derived from pineapple. This was done as an example for the life science and food chemistry industries. The aim was to verify the altered results using a laboratory organisation system.

Enzymatic reactions are essential for the maintenance of vital functions in living organisms. As specific biocatalysts, they speed up chemical reactions, enable efficient metabolic processes and are essential for biochemical processes.

Methodology

Two experimental setups were compared: one with the SmartRack® and one without. The changes in workplace organisation, the ability to perform contamination-free experiments and the accuracy of data collection were evaluated. The facilitation of standardisation and the impact on reproducibility were also examined. The SmartRack® laboratory organisation system aims to provide a more effective, ergonomic and consistent way of working.



A pipette tip is discarded into a waste bag after use in a SmartRack® classic.

Comparison of experimental set-ups with and without SmartRack®

In the experiment with SmartRack®, the necessary chemicals and materials were available directly at the workstation in the correct order. Pipette tips, gloves, tweezers and pipettes were neatly organised in the SmartRack®.

The use of imprecise pipettes, contaminated or incorrect materials can affect the smooth running of enzymatic reactions. For example, the use of talcum-coated gloves and their entry into the sample can affect enzymatic activity. Double distilled water is required for dilution series. The choice of module holders means that the chemicals and materials required for the experiment are available at the workstation in a standardised, ergonomic arrangement without having to search for them. The integrated storage box provides safe, contamination-free storage of samples while liquids are being added or the reaction is being observed. The tablet holder in the SmartRack® allows results to be digitised immediately, minimising transmission errors.

In the traditional, unorganised setup, obtaining chemicals, equipment and materials requires additional walking and searching. Unsorted pipettes, gloves and other materials create disorder, inefficiency and increase the risk of contamination. Traditional test tube or tube racks present a risk of instability and potential tipping. They cannot be stacked and take up a lot of workspace. There is little room for parallel experiments with additional materials and samples during reaction and waiting times.

Conclusion

The use of the SmartRack® system in enzymatic experiments showed significant advantages in terms of organisation, experimental stability and efficiency. The SmartRack® system reduces sources of error and contamination, especially in food chemistry and life sciences, by providing a standardised arrangement and the possibility of digitising the results. This study highlights the importance of a laboratory organisation system and suggests that a 30% increase in efficiency is possible through the use of SmartRack®.



A laboratory threaded bottle is removed from a holder module with retaining ring from a SmartRack® classic.



Photo: Building of the Better Basics Laborbedarf GmbH in Dresden



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Marcus Heinze was born in Zittau and is now a partner and Head of Development at Better Basics Laborbedarf GmbH. He completed his studies in polymer chemistry at the TU Dresden with a doctorate in the field of mineralisable hydrogels. Today he is responsible for development at Better Basics Laborbedarf. The area of product development is dedicated to multidimensionally optimised component design, which combines the possibilities of various 3D printing processes with those of classic metal processing.

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Are you interested in our products or have any further questions?

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Our request to you

A product like our SmartRack® is only as good as its users. With our roots in the Leibniz Institute for Polymer Research Dresden, our company Better Basics Laborbedarf stands for the tradition of "Made in Germany" quality. We feel in multiple aspects committed to this quality label for German companies, which stands for high innovative strength. Even beyond our product catalog, the same applies for us at Better Basics: Just contact us if you have ideas for extensions or improvements or if you notice something in your daily laboratory routine that we should optimize right away.

We want to create the best possible working environment for you in the laboratory and we are grateful for any comments and inspiration. We can jointly shape the future of laboratory work by cooperating with scientists and researchers. Just like you, we're always looking for a way to make our world a little better every day.

Impress:

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