

PARTWELL

CUTTING TECHNOLOGY SPECIALISTS

Below is an evaluation of Apex Cutting Boards as carried out by Drs F J Bolton, D Coates and K Williamson of Preston Public Health Laboratory, Royal Preston Hospital, POBox 202, Sharoe Green Lane North, Preston, PR2 4HG. The report was prepared on behalf of Mr A Bradburn of Partwell Ltd on 16 September 1994.

INTRODUCTION

APEX cutting boards are widely used in butchery, the fish trade and in catering. These boards have been subjected to rigorous inspections by Environmental Health Officers, but there is no information available on the interaction of Apex boards with micro organisms. The purpose of the present investigations was to challenge the Apex boards, in controlled laboratory experiments, with large numbers of micro organisms, to determine survival rates, cleaning regimes and to investigate heat stability of the Apex boards.

Study 1 The effect of hot water alone on contaminated cutting boards.

Method

In this experiment only the strain of *Staph aureus* was used because of its potential to survive for longer periods (worse case). The organisms were inoculated onto the board in blood and allowed to dry onto the surface as described previously. The board was then tested with contact plates before treatment and was then placed in water at 65.5°C for 10 minutes. This was done using a temperature controlled laboratory water bath. Before retesting the board was allowed to air dry.

Results and Conclusions

Prior to treatment the contact plates taken from the contaminated board showed semi confluent growths of *Staph aureus*. This is not surprising because 65.5 °C for 10 minutes is similar to the pasteurisation temperatures used for heat treatment of milk. Hence, immersion in very hot water (65 °C) is an effective way of cleaning and decontaminating the surface of Apex boards. Whilst this temperature may be achievable in dishwashing machines it is not safe to use when washing/cleaning by hand. Immersion of the board in water at 65.5°C did not cause any deformity to the shape or size of the board.

Study 2 The effect of hand washing with detergent on contaminated cutting boards.

Method

The contaminated board was prepared with the *Staph aureus* as described above. The board was tested prior to treatment with contact plates. The contaminated board was immersed in warm tap water (40 °C) containing washing up liquid (Fairy Liquid) and washed with a clean dish cloth (no scrubbing agent was used). The board was removed from the sink and allowed to dry in air.

Results and Conclusions

The contact plates prior to washing showed a semi confluent growth of the *Staph aureus* strain. Of the three contact plates tested after one had three colonies of *Staph aureus*, one had two colonies of *Staph aureus* and the other showed no growth. These results indicate that simple washing in warm tap water (40°C) with detergent is an effective way of cleaning the boards. However, it does not result in complete decontamination of the board and a more rigorous approach is necessary to achieve this. Use of higher water temperatures is not an option for manual washing because the maximum tolerable is about 45°C. In the experiment we did not rinse the board after washing and this may have removed the few remaining organisms.

Study 3 The effect of handwashing contaminated boards in warm water containing a chlorine based sanitizer.

Method

The method of preparation of the contaminated board and the test procedure is described above. In this experiment the board was immersed in warm tap water (40°C - 42°C) containing 1% Titan sanitizer. The board was washed with a dish cloth, rinsed in cold tap water and allowed to air dry.

Results and Conclusions

The control contact plates taken before treatment showed a semi^aconfluent growth of Staph aureus. All three replicate control plates taken after the treatment procedure showed no growth of organisms. These results indicate that immersion and washing of boards in a mild solution of sanitizer is an effective and simple way of removing and eliminating bacteria from the Apex boards.

Study 4 The effect of cleaning boards contaminated with raw foods.

Method

An Apex board was used to cut a raw beefburger which contained 20,000 organisms/g of meat. These organisms included E.coli Staph aureus. In a second experiment untreated mild containing 6,000 organisms/ml was tipped onto the surface of the board and allowed to dry. These two experiments produced heavily soiled and contaminated surfaces similar to that which may occur when the boards are in use in catering establishments.

Results and conclusions.

Prior to cleaning the board contaminated with organisms from the beefburgers the control contact plate showed growth of 85 colonies. After washing all three contact plates showed no growth of organisms. With the raw mild the control contact plates showed 22 colonies, but after washing all three contact plates showed no growth of organisms. This study confirms that hand washing in warm water containing Titan sanitizer is a simple and effective procedure for cleaning and disinfecting Apex boards.

Study 5 The effect of autoclaving Apex boards

Method

Samples of Apex material were subjected to heating in steam at 100°C for 15 minutes and free steam for 10 minutes using laboratory controlled autoclaves.

Results and Conclusions

Subjecting the Apex boards to the elevated temperature (100°C) resulted in no distortion, no curling and no twisting of the samples. When placed in free steam the Apex material became more malleable but on cooling returned to its original form. Steam cleaning up to 100°C is therefore a realistic option for sterilisation of the boards.

OVERALL COMMENTS

The results of the various investigations are summarised in the Table. From this table it is clear that either a simple cleaning procedure using a sanitizer or use of dishwashers with high temperature wash cycles, are suitable methods to eliminate potential food poisoning bacteria from the surface of Apex boards. These studies were undertaken with Apex boards which had not been used and hence had intact and perfect surfaces. The results presented in this study only apply to new boards and cannot be extrapolated to old board with scored surfaces. We would suggest that to confirm the advantages of the Apex board further testing should be done on boards which have been in routine use for some time.

TABLE

THE EFFECT OF VARIOUS PROCEDURES ON THE CLEANING AND DECONTAMINATION OF APEX CUTTING BOARDS

Apex Board Cleaning Procedure	Colony counts per contact plate		
	Board inoculated with 10 million Staph aureus	Board used for cutting beefburgers	Board coated with untreated milk
Tested before the cleaning procedure	semi-confluent*	85	22
Tested after hand-washing in warm water (40°C) containing a detergent	3	ND	ND
Tested after immersing the board in hot water (65.5°C) for 10 minutes	0	ND	ND
Tested after hand-washing in water (40°C) containing a chlorine based sanitizer	0	0	0

* SC - Semi-confluent growth - colonies too numerous to count