

EVALUATION OF THE LOAD (TRAINING LOAD) IN GAME  
SITUATIONS OF BASKETBALL AND APPLICATION TO THE  
TRAINING

(RESEARCH PROJECT)

DAVID RIBERA NEBOT

TUTOR: FRANCISCO SEIRUL-LO VARGAS

DEPARTMENT OF PHYSICAL EDUCATION  
(NATIONAL INSTITUTE OF PHYSICAL EDUCATION AT BARCELONA)

Support: CATALONIA BASKETBALL COACHES ASSOCIATION

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## 1. GOALS

- To assess movement and physiological parameters of the basketball player in basic game situations(1 on 1, 2 on 2 and 3 on 3).
- To create performance indexes for the game situations studied connecting movement and physiological parameters.
- To determine, in different season periods, the load levels of each game situation studied comparing the movement, physiological and performance index parameters.
- To propose practical criteria to plan the technical-tactical training loads and the "basic and facilitating conditional capacities" training loads in a basketball team.
- To propose practical criteria to plan the effort percentages in the training of the "basic and facilitating conditional capacities"(speed, strength, endurance, flexibility and dynamical relaxing).
- To analyze the effects of a specific endurance training in the performance of the different game situations of basketball analyzed.

## 2. WORK PLAN

The realization of the proposed study depends on the possibilities of the team and it will be adapted to the conditions of the Head Coach. (It also depends on the availability of the Department).

For this reason we propose options that will permit to accomplish a reduced research (investigation) in case that it will not be able to develop all parts of the study.

### Subjects, staff, equipments, and installations

.Subjects: basketball players of the University team.

4 experimental subjects: ESa, ESb, ESd and ESd.

8 subjects: S1, S2, S3, S4, S5, S6, S7, S8.

.Staff: specialized persons to analyze the lactic acid, ventilatory parameters, and to film the players in movement.

.Equipment: -Equipment to record the pulse rate  
 -Equipment to analyze the lactic acid in court.  
 -Equipment to analyze the ventilatory parameters in court.  
 -Film camera (video camera).

.Installations: -Basketball courts of the University.  
 -Analysis rooms.

2.1. Bibliografic analisys about the specific subjects of the study.

2.2. Assessment (evaluation) of the movement and physiological parameters of the basketball player in basic game situations

2.2.1. Game situations to analyze:

- 1 on 1. (1 against 1)
- 2 on 2.
- 3 on 3.

Each situation in:

- One quarter of the court.
- Full court.

Each situation during:

- 1 minute.
- 2 minutes.

Game rules:

- .Free game.
- .Defense full court man to man.
- .Application of the basketball game rules without stopping the effort.

\* Option: to eliminate the variable: 2 minutes.  
(The 12 situations to analyze would be reduced to 6)



### 2.2.2. Movement and physiological parameters to assess:

#### .Movement parameters:

- Number of actions (technical movements).
- Type of actions.

#### .Physiological parameters:

- Pulse Rate (PR).
- Lactic Acid (LA).
- Ventilatory parameters (VP): CO<sub>2</sub>, O<sub>2</sub>,...

Before the effort: PR, LA, VP.

During the effort: PR, number and type of actions.

After the effort: PR, LA, VP.

- \* Option: .To eliminate the assessment of VF.  
.To eliminate the assessment of LA.

2.2.3. Assessments of the movement and physiological parameters.

.There will be three periods of assessment during the season:

First: at the beginning of the season.  
 Second: after two months.  
 Third: after two months.

In every period of assessment the 6 or 12 game situations will be analyzed in each of the four experimental subjects: ESa,ESb,ESc,ESd. (48 or 24 evaluations)

- 1 on 1	Full court	1 minute
- 1 on 1	One quarter of the court	1 minute
- 1 on 1	Full court	2 minutes
- 1 on 1	One quarter of the court	2 minutes
- 2 on 2	Full court	1 minute
- 2 on 2	One quarter of the court	1 minute
- 2 on 2	Full court	2 minutes
- 2 on 2	One quarter of the court	2 minutes
- 3 on 3	Full court	1 minute
- 3 on 3	One quarter of the court	1 minute
- 3 on 3	Ful court	2 minutes
- 3 on 3	One quarter of the court	2 minutes

All of the factors to analizze before, during and after the effort will be assessed in each one of the experimental subjects (ESa,...,ESd). Only the Pulse Rate before and after the effort will be assessed in the other subjects (S1,...,S8).



2.3.

.Study of the number and type of actions in each experimental player during 3 or 4 games(16 games).

.Study of the effort time and the rest time in each experimental player during 3 or 4 games(16 games).

Every experimental player will be filmed independly during 3 or 4 games of the season.

2.4. Training experience of specific endurance.

The four experimental subjects will be divided in two groups of two: Experimental group(ESa,ESb) and Control group(ESc,ESd). The experimental group, in addition to practices, will practice specific endurance two times per week while the control group will only follow the normal practices.

The duration and the objective of the specific endurance practice will be adapted to the interests of the Head Coach.

The effects of the specific endurance training will be observed through the performance in the game situations studied.

\* Option: not to do the experience of specific practice.

## 2.5. Results analysis.

### 2.5.1. Individual analysis:

- In each situation of game.
- In three periods of the season.

.Create performance indexes connecting movement and physiological factors and to establish the differences of load.

- Number of actions/Lactic Acid accumulated  
(during effort)
- Number of actions/Mean of Pulse Rate  
(during effort)
- Number of actions/CO<sub>2</sub> accumulated  
(during effort time)

(also with other ventilatory parameters)

.Analysis of the variations in movement, physiological and performance indexes parameters.

.Study of the effort in every five seconds period of actions through the Pulse Rate like an expression of the energetic expense.

.Classification of the number and type of actions.

### 2.5.2. Group analysis

.To establish a general load value to every situation of game connecting the loads among the studied players.

.Definition of a general percentage of the type and number of actions that are taken in every game situation connecting the values of the studied players.

2.5.3. Comparison between the type and number of action analyzed during the games and the general values obtained during the game situations studied.

2.5.4. Study of the effect of a specific endurance training on the movement and physiological performance in each of the game situations studied.  
(comparison of the experimental group values with the control group values)

## 2.6. Discussion.

### 2.6.1. Proposal of practical criteria to:

- Plan the effort percentages for training the basic conditional capacities (speed, strength, endurance) and the facilitating conditional capacities (flexibility and dynamic relaxing).
- Organize the conditional capacities training load in the basketball player.
- Organize the technical-tactical training load for the basketball player.

*- Plan % effort aspects basic-tactical*

*- Crear una metodología de valores de carga de entrenamiento*

*del diferente aspectos de entrenamiento físico-técnico-táctico*

### 2.6.2. Comments about the energetic expense that can be a sequence of basketball actions of 5 seconds duration.

### 2.6.3. Modifications and improvements for a posterior study.

## 2.7. Writing of the work memory, reviews and final writing.

### 3. REFERENCES

COLLI, R. and FAINA, M. "Investigación sobre el rendimiento en baloncesto". Revista de Entrenamiento Deportivo. V.1 No 2. 1987.

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APPENDIX: SUMMARY OF THE PREVIOUS STUDY PROJECT

(Department of Physiology and Biomechanics of the  
"Istituto Scienza dello Sport" ("Scuola dello  
Sport"(C.O.N.I.)Italy)

It is only presented punctually the main characteristics that change the basic project:

- One period of evaluation.
- One Experimental subject.
- Game situations to analyse: 1 on 1, 2 on 2, 3 on 3; full court; 1 minute, 2 minutes.
- Not training experience.