FISA

FISA Development Programme

Daily Training Programme

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How to Use this Programme

This manual is intended to serve as a guideline for daily training. Of course, the conditions vary in each country and this must be taken into account. For example, rowers in Iceland cannot do the same training sessions as the rowers in Indonesia. As well, rowers in the Southern Hemisphere often have to have two peaks in their seasons; one for the southern hemisphere championships (typically March or April) and one for the World Championships which are usually in the northern hemisphere in August or September.

Training Phases

The year has been divided into 12 months of training. The first month (month 1) is the month immediately after the end of the season. Usually the targeted or peak competition concludes the rowing season. Therefore, month 12 should be the peak competition, either the national championships, the regional championship or the World Championships. You should decide on the peak competition for each rower and count backwards to establish the number of the relevant months of training. If the World Championships is the peak competition and it is in September, then October is month one.

This programme divides the year into six main phases. They are listed below with their relative aims:

Recovery Period	Active recovery	Month 1
Early Preparation Period	General Strength and Endurance	Months 2 and 3
Preparation Period	Maximum Strength and General Endurance	Months 4 and 5
Pre-Competition Period	Maximum Strength and Specific Endurance	Months 6 and 7
Early Competition Period	Specific Endurance and Rowing Technique	Months 8 and 9
Peak Competition Period	Race Preparation and Peak Performance	Months 10 thru 12

Yearly Periods:					
Month 1	Months 2 & 3	Months 4 & 5	Months 6 & 7	Months 8 & 9	Months 10-12
Training Periods:					
Recovery Period	Early Preparation Period	Preparation Period	Pre-Competition Period	Early Competition Period	Peak Competition Period
Training Goals:					
Active Recovery	Strength and General Endurance	Maximum Strength and General Endurance	Basic Endurance and Rowing Technique	Specific Endurance and Rowing Technique	Peak Race Preparation

Training Intensity

The intensity of training is expressed in "Heart Rate" with an indicated target zone based on a percentage of maximum heart rate. Maximum heart rate is either determined through observation of the athlete in peak exercise or can be estimated based on 220 minus age. In the programmes a heart rate of 200 is used as the typical maximum. Of course, each individual will vary from this slightly. Intensity is also expressed in percentage of maximum heart rate (% Max).

Training Effect

All training models presented in the training programmes have a primary intended physiological effect. The physiological effects are related to the aerobic and anaerobic energy systems as follows:

Heart rate range	Percentage of Maximum HR	Physiological Effect
130 to 150	65 to 75 %	Utilization (mainly fats)
140 to 160	70 to 80 %	Utilization 1 (mainly glycogen)
160 to 170	80 to 85 %	Anaerobic Threshold
170 to 190	85 to 95 %	Transportation
Max	Max	Anaerobic

In order to get the intended benefits of the training effect, it is recommended that you stay within the target heart rate range.

Indicated Stroke Rate

The stroke rate is closely related to the heart rate, but has its own technical effect. Close to the regatta season, and in the the regatta season, it is important to train in the stroke rate range in which we are supposed to compete.

The single sculls and the eight will use different stroke rates. In the programme the lowest number is the indication for the small boats and the higher number is the stroke rate for the fours and eights. Weather conditions must also be taken into consideration, for example, a lower stroke rate into a headwind or traveling upstream on a river.

Heavyweights, Lightweights, Men, Women and Juniors

There is, in theory, no differentiation in this programme between these categories of rowers. The differentiation, of course, comes with experience and general conditioning.

Women can use the same training programme as men. Their maximum strength is lower and muscle volume less. However, their adaptation to endurance is as high or higher than men. Scientists, and practical experience indicates that women recover more quickly from heavy endurance training than men.

Heavyweights, Lightweights, Men, Women and Juniors (continued)

Lightweights can also follow the same training programme. The only difference comes in weight lifting where we recommend that they stay away from the 60 to 80% of maximum range. This is where muscle hypertrophy occurs which is probably not desired near to the competition season. This is explained in the Instructions for Strength Training.

Juniors should follow the club training programme as they are most likely new to the sport. Only the exceptional junior is recommended to follow the national team programme. Juniors are also advised to stay away from maximal strength training as their bodies are not yet mature and they are still often learning weight lifting technique.

Time Requirement

To follow this programme fully from month one to month twelve, you will need approximately 650 hours of effective training. The total number of kilometers on the water is approximately 4,500. An international rower from the former socialist countries rowed up to 1,500 hours per year and between 7,000 and 9,000 kilometers per year. The average elite rower from western Europe uses approximately 700 to 900 hours per year and rows between 4,500 and 6,000 kilometers.

Reduction of the Programme

School and work problems will inevitably force certain interruptions in following the programme. When reduction of the programme is unavoidable, retain the endurance training wherever possible and give priority to the training in the boat.

Terminology

To avoid misunderstandings, the following terms are found in the programme and are defined as follows:

Steady State - Aerobic training with metabolic balance. Energy is covered 100% aerobically or with a small amount of anaerobic capacity involved (without accumulated lactic acid).

Interval - Interval principle: Training with periodic changes between exertion and rest, or between high and low work loads (interval work). The various types of interval training can be divided into two categories; short interval training and long interval training. Short interval training involves work periods of up to two minutes and rests that are so short that oxygen uptake and the pulse rate (in the rest interval) do not decrease appreciably before the start of the next work period.

Long interval training involves work periods from two minutes and up to 10 to 15 minutes, and rest lengths such that the work intensity can be maintained approximately constant during each work period.

The short interval is very important during the regatta season to keep a good quantity of training in the right area of race velocity, and use of the stroke rate appropriate for competition.

Rhythm Variations - Training with a primarily aerobic effect, but also with some input of anaerobic energy. The training gives a good opportunity to control and train the rowing technique in different levels of intensity.

Fartlek - Training according to the interval principle, of relatively long duration (8-12 km), with improvised alteration between high and low intensity, and with the main purpose of increasing or maintaining aerobic endurance. Gives a good opportunity to control the technique during different levels of intensity.

Model Training - Training that simulates race conditions including "warming up", start proceedings and race tactics. Should be organised with other crews and made as close to regatta conditions as possible.

Speed Training - This term is used to describe of the high intensity training in preparation for regattas (Super compensation principle). This means mainly overproduction of speed (speed higher than 2,000 meter race speed). This is the only specific anaerobic training in the programme. It also has a technical element and over stimulates the muscular contraction velocity.

Warm-up - Warm-up for training involves, first, a short period of jogging to get blood flow into the muscles and fluid into the joints. This is followed by ten to 15 minutes of stretching and then placing the boats on the water to row. Once on the water, partial strokes (quarter slide, half slide, etc.) lead to full slide strokes with varying degrees of power to move the body into a training or competition ready mode. Race warm-ups include the above plus some practice starts from four up to 30 strokes in order to bring the boat together.

Stretching and Flexibility, and Strength Training are defined in the Instructions for Strength Training section starting on page 7.

Good luck with your training and remember that there is no substitute for quality in training!

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Commission for Competition Rowing

Strength Training Instructions

Strength training will include four types of training: stretching and slexibility, circuit training using body weight, endurance strength training and maximal strength training.

Stretching and Flexibility

As mentioned on each page of the training programmes, stretching and flexibility exercises are strongly recommended before and after each training session. The reasons for this are the following:

- Reduces muscle tension
- Helps coordination by allowing for freer and easier movement
- Increases range of motion
- Prevents injuries such as muscle strains
- Prepares muscles for training because it activates the muscle's nerve system
- Helps develop body awareness

The correct way to stretch is to slowly move into the stretched position, sustain the stretch for 10 to 30 seconds. No bouncing. Go to the point where you feel a mild tension, and relax as you hold the stretch. Breathing should be slow, rhythmical and under control. Do not hold your breath while stretching. The feeling of tension should subside as you hold the position. If it does not, ease off slightly and find a degree of tension that is comfortable. Then relax for a few seconds.

Now stretch the same muscle or muscle group again. Move a fraction of a centimeter further until you again feel a mild tension and hold for another 10 to 30 seconds. Again the tension should diminish, if not, ease off slightly. Please refer to page 12 for the recommended stretching exercises.

Body Weight Circuit Training

A useful supplement to a training session is the body circuit. By using the body's mass as the resistence, you can have a quick and effective strength training session. The coach should lead the session and rowers should work in pairs at each station around the gymnastics room. The intervals can be by time (for example, 30 seconds work, switch to the partner, 30 seconds rest while the partner works, etc.) or by repetitions counted outloud (for example, 30 repetitions, switch to the partner, 30 repetitions for the partner). This method of training is particularly good for young athletes to develop muscle coordination. Please refer to page 13 for the recommended exercises.

Endurance Strength Training

In months 4 and 5 you will find one endurance strength training session each week. These months are usually the coldest and darkest months of winter, therefore endurance fitness can also be developed in the weight lifting room. Muscular Endurance is developed using a lower intensity (40 to 50% of 1 repetition max) and a high number of repetitions. The recovery period is relatively short to obtain an optimal circulatory and muscular training effect. The speed of movement is similar to the stroke rate used during rowing endurance outings. A high number of repetitions (600 to 1100 repetitions) is necessary to obtain an optimal effect. Please refer to page 14 for the recommended exercises, intensities and repetitions.

Maximal Strength Training

General strength is needed in the development of optimal technique and for the creation of the necessary conditions for improving physical performance levels. Maximal strength is the determining component for peak force production during the rowing race. Gains in maximal strength need a high intensity programme (80 to 95%), a low number of repetitions, and a relatively high number of sets with a recovery period between each set. The total number of repetitions during one training session varies between 220 and 240. During the first training period (month 2 of the programme) after a rest transition period, the athletes should follow a general strength programme. Three weekly training sessions can prepare the muscles for more specific training components later. In the next months (3, 4 and 5), the programme will alternate between maximal strength and endurance strength.

There is a difference in training modalities between heavy and light weight rowers with respect to maximal strength training. Lightweight rowers will generally use load intensities between 80 and 95% of 1 rep max. Maximal or near maximal intensities will mainly have an effect upon maximal strength without a significant muscular hypertrophy. This type of training can avoid too much gain in body weight during the out-of-season period (see "high pyramid" on page 11). The heavyweight rowers can bring more variety in their programme using load intensities between 65 and 95% max. When the attention is focused upon muscular hypertrophy, the intensity will vary between 65 and 75% (see "standard pyramid" on page 11).

In the junior programme, maximal strength training will be realized by strength pyramids between 60 and 80% (see "low pyramid" on page 11). During the first years of training, maximal resistance exercises must be avoided. Experiments have proven that strength gains are difficult to realize before puberty.

Using the Pyramid System

Start each strength training session with a thorough warm-up and stretching session. Strength training should take place in groups of two to three. This provides time for rest and stretching while the partner is working.

Start from the bottom of the pyramid and work up to the top. The rest period takes place while the partner does the same. The athletes continue with the same exercise until all the given series have been finished.

If available, use a weight lifting belt to provide support to the lower back, especially when using free weights. Always control the technique of the movement to avoid injuries.

Exercises E and F on page 15 do not fit into a "pyramid" programme. Take these two exercises with a load that can be repeated 8 to 10 times and maintain 4 to 6 series.

Cool down after training with a thorough stretching and flexibility programme.

Daily Training Programme for Clubs or Juniors

The programme presented here (pages 16 to 27) is intended for juniors 18 years and under as well as club level rowers. This includes newcomers to the sport of all ages. This is a year round programme which includes daily training sessions. Research and experience show that daily, year round training is the best way to improve performance in endurance sports like rowing. After using this programme for two to four years, the rower will be ready to advance to the higher training loads presented in the National team training programme.

During the furst few years of training it is important to emphasize the necessity of daily training and rowing as often as possible. This programme presents a weekly training schedule for each month of the rowing year. The training week should be repeated each week of the month except in the competition period when a special programme for specific race preparation may be used. This special programme commences 7 to 8 days before the weekend of racing.

National Team Daily Training Programme

The programme presented here (pages 28 to 38) is intended for rowers 19 years of age or older who have been training for more than 2 to 4 years. This programme is demanding both in energy output and in time devoted to training. In months 9, 10, 11, and 12, two training sessions per day are presented. Before starting with this programme, it is important to evaluate the level of motivation of the rower. This programme is appropriate for the athlete who is motivated to compete at the international level and is able to commit to the required energy and time.

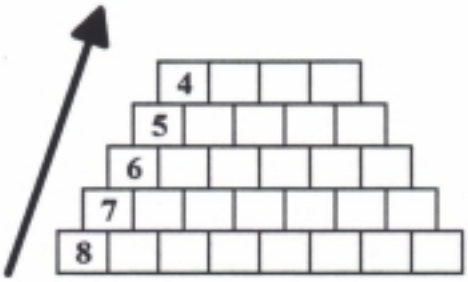
This programme, like the club programme, presents a weekly training schedule for each month. In the competition period, a special programme has been included for specific race preparation. This special programme commences 7 to 8 days before the weekend of racing.

Maximum Strength Pyramids

For use with Maximum Strength Training Sessions

1. Newcomers to Rowing and Juniors

4 Reps at 80%
5 Reps at 75%
6 Reps at 70%
7 Reps at 65%
8 Reps at 60%

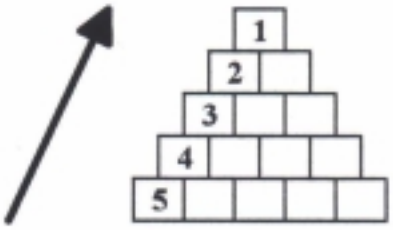


"Low Pyramid"

- Body Still Developing, or
- New to Weight Lifting Technique
- Want to Build Muscle Mass

2. Experienced Heavyweights

1 Rep at 95%
2 Reps at 90%
3 Reps at 85%
4 Reps at 80%
5 Reps at 75%

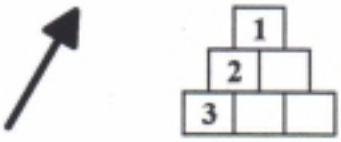


"Standard Pyramid"

- Growth Phase is Complete
- Experienced in Weight Lifting
- Want to Build Muscle Mass

3. Experienced Lightweights

1 Rep at 95%
2 Reps at 90%
3 Reps at 85%



"High Pyramid"

- Growth Phase is Complete
- Experienced in Weight Lifting
- Don't Want to Build Muscle Mass

Appendix A

Flexibility and Stretching

To be performed for 10 to 15 minutes before and after every training session.